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THE
GEOLOGICAL RECORD
FOR
1877.

AN ACCOUNT OF WORKS
ON
GEOLOGY, MINERALOGY, AND PALÆONTOLOGY
PUBLISHED DURING THE YEAR,

WITH SUPPLEMENTS FOR 1874-1876.

EDITED BY
WILLIAM WHITAKER, B.A., F.G.S.,
OF THE GEOLOGICAL SURVEY OF ENGLAND.

LONDON:
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1880.

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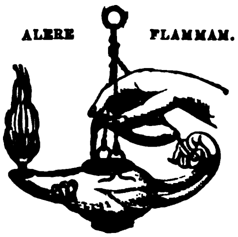
ALERE FLAMMAM.

PRINTED BY TAYLOR AND FRANCIS,
RED LION COURT, FLEET STREET.

PREFACE.

THIS fourth volume of the GEOLOGICAL RECORD shows an increase of a few pages over the last.

Great delay in publication has been caused by the loss of MS. in transmission—the missing part (European Geology) having been appropriated by some very wise person as an article of great value, and not recovered for some months.

In deference to the request of various Subscribers, the price of books has been given, when that could be done without much trouble.

The only change of plan consists in the placing of the supplementary notices for former years at the end of each section, instead of in an unclassified mass at the end of the book.

The great amount of this supplementary matter results chiefly from the impossibility of noting many publications until long after they have appeared, but partly also from the usual habit of mankind (from which even Contributors to the GEOLOGICAL RECORD are not free) to leave "undone those things which we ought to have done." Moreover, to make up for these sins of omission, "we have done those things which we ought not to have done," for occasionally a "Recording Angel" has noticed the same thing two or three times over. I must acknowledge the zeal of Mr. DALTON in looking up omitted papers, &c.

There will always be these additions; and, indeed, to be any thing like perfect is simply impossible with the means at our command. Nor perhaps would perfection be altogether pleasing, as it would put an end to a pet phrase of our palæontological brethren, and prevent them from discoursing eloquently of "The Imperfections of the GEOLOGICAL RECORD."

WILLIAM WHITAKER.

London, December 1879.

THE previous Volumes of the GEOLOGICAL RECORD can be had of the Publishers.

That for 1874, pp. xvi, 397, for 15 Shillings.

That for 1875, pp. xx, 443, for 16 Shillings.

That for 1876, pp. xxii, 416, for 16 Shillings.

The Subscription-price is 10 Shillings and 6 Pence.

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Act. Soc. Helv. Sci. Nat.—Actes de la Société Helvétique des Sciences Naturelles; [and] Verhandlungen der schweizerischen naturforschenden Gesellschaft. *Various Swiss Towns.*

Act. Soc. Linn. Bordeaux.—Actes de la Société Linnéenne de Bordeaux. *Bordeaux.*

Amer. Chemist.—The American Chemist. A monthly Journal of Theoretical, Analytical, and Technical Chemistry. *New York.*

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Amer. Nat.—American Naturalist. *Salem, Mass.*

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Bull. Soc. Niv. Lett. Sci.—Bulletin de la Société Nivernaise de Lettres, Sciences et Arts. *Nevers.*
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Canad. Nat.—Canadian Naturalist and Quarterly Journal of Science, with the Proceedings of the Natural History Society of Montreal. *Montreal.*
Cape Monthly Mag.—Cape Monthly Magazine. *Cape Town.*
Chem. Centr.—Chemisches Centralblatt. *Leipzig.*
Chem. News.—The Chemical News and Journal of Physical Science. 4to. *London.*
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Journ. App. Sci.—Journal of Applied Science. Fol. *London.*

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Journ. Bath W. Engl. Soc.—Journal of the Bath and West-of-England Society and Southern-Counties Association for the Encouragement of Agriculture, Arts, Manufactures, and Commerce. *Bath.*

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Min. Journ.—Mining Journal. Fol. *London.*

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Rep. Geol. Surv. W. of 100th Meridian.—Report upon Geographical and Geological Explorations and Surveys West of the One Hundredth Meridian. 4to. *Washington.*
Rep. Rugby School Nat. Hist. Soc.—Report of the Rugby School Natural History Society. *Rugby.*
Rep. Teign Nat. Club.—Report of the Proceedings of the Teign Naturalists' Field Club. *Teignmouth.*
Rep. U. S. Geol. Expl. 40 Par.—Report of the United States Geological Exploration of the 40th Parallel. *Washington.*
Rep. U.S. Geol. Surv. Territories.—Report of the United States Geological Survey of the Territories. 4to. *Washington.*
Rep. Winchester Coll. Nat. Hist. Soc.—Report of the Winchester College Natural History Society. *London and Winchester.*
Rev. Géol.—Revue de Géologie (by Delesse and De Lapparent). *Paris.*
Rev. Mar. Col.—Revue Maritime et Coloniale. *Paris.*
Rev. Min.—Revista Minera. Periodico Cientifico e Industrial. *Madrid.*
Rev. Sci.—Revue Scientifique de la France et de l'Étranger. 4to. *Paris.*
Rev. Sci. Nat.—Revue des Sciences Naturelles. *Montpellier.*
Rev. Univ. Mines.—Revue Universelle des Mines, de la Métallurgie, des Travaux Publics, des Sciences et des Arts appliqués à l'Industrie. *Paris.*
Riv. Mar.—Rivista Marittima. *Rome.*
Riv. Sci.-ind.—Rivista Scientifico-industriale. *Florence.*
Rozpr. Ak. Umiej. Krakow.—Rozprawy i Sprawozdania z Posiedzen. Akademii umiejetnosci w Krakowie. Wydzial matematyczno-przyrodniczy.

[Transactions of the Cracow Science Academy. Mathematical and Natural History Section.] *Cracow.*

R. Sch. Mines Mag.—The Royal School of Mines Magazine. *London.*

Russ. Rev.—Russische Revue. (Röttger's.) *St. Petersburg.*

Schrift. nat. Ver. Berlin.—Schriften des naturwissenschaftlichen Vereins zu Berlin. *Berlin.*

Schrift. phys.-ökon. Ges. Königsberg.—Schriften der physikalisch-ökonomischen Gesellschaft zu Königsberg [including *Abhandlungen* and *Sitzungsberichte*]. 4to. *Königsberg.*

Schrift. Ver. Gesch. Bodens.—Schriften des Vereins für die Geschichte des Bodensees und seiner Umgebung.

Schrift. Ver. nat. Kenntn. Wien.—Schriften des Vereins zur Verbreitung naturwissenschaftliche Kenntnisse in Wien. 12mo. *Vienna.*

Sci. Contemp. La Scienza Contemporanea. *Messina.*

Science and Art.—Science and Art. A Monthly Journal, specially devoted to meet Requirements of Science and Art Teachers and Students. [Continued as *Students' Mag.*] 4to. *London.*

Sci. Goss.—Hardwicke's Science Gossip. *London.*

Sitz. Ges. Beförd. gesammt. Nat. Marburg.—Sitzungsberichte der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg. *Marburg.*

Sitz. Ges. nat. Freunde Berlin.—Sitzungs-Bericht der Gesellschaft naturforschender Freunde zu Berlin. *Berlin.*

Sitz. Isis Dresden.—Sitzungs-Berichte der naturwissenschaftlichen Gesellschaft Isis in Dresden. *Dresden.*

Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.—Sitzungsberichte der kaiserlichen Akademie der Wissenschaften, mathematisch-naturwissenschaftliche Classe. *Vienna.*

Sitz. k.-bay. Ak. Wiss.—Sitzungsberichte der mathematisch-physikalischen Classe der königlich-bayerischen Akademie der Wissenschaften zu München. *Munich.*

Sitz. k. böhm. Ges. Wiss.—Sitzungsberichte der königlichen böhmischen Gesellschaft der Wissenschaften. *Prague.*

Sitz. Nat. Ges. Dorpat.—Sitzungsberichte der Naturforscher Gesellschaft zu Dorpat. *Dorpat.*

Sitz. nat. Ges. Hannover.—Sitzungsberichte der naturhistorischen Gesellschaft in Hannover. *Hanover.*

Sitz. nat. Ges. Leipzig.—Sitzungsberichte der naturforschenden Gesellschaft zu Leipzig. *Leipzig.*

Sitz. phys.-med. Soc. Erlangen.—Sitzungsberichte der physikalisch-medicinischen Societät zu Erlangen. *Erlangen.*

Skand. Nat. Forh.—Skandinavisk Naturforskerinödet Forhandlinger. *Copenhagen.*

Sprawozd. Kom. Fizyj. Krakow.—Akademija Umiejetnosci w Krakowie. Sprawozdanie Komisyi Fizyjograficznej obejmujace poglad na czynnosci dokonane w ciagu rokn 187 . oraz materyjaly do fizyjografii Galicyi. [Cracow Academy of Science. Reports of the Physiographical Committee.] *Cracow.*

Students' Mag.—The Students' Magazine of Science and Art: a Monthly Journal . . . . for Private and Class Students and Teachers. [In continuation of *Science and Art.*] 4to. *London.*

Sver. Geol. undersökn.—Sveriges Geologiska Undersökning. [Swedish Geological Survey.] *Stockholm.*

Termész. Füzet.—Természetrajzi Füzetek, az Allat-, Noveny-, Asvany- es Földtan Köréböl. [Natural History Book for Zoology, Botany, Mineralogy, and Geology.] *Budapest.*

Trans. Ac. Sci. St. Louis.—The Transactions of the Academy of Science of St. Louis. *St. Louis* [*Missouri*].

Trans. Albany Inst.—Transactions of the Albany Institute. *Albany.*

Trans. Amer. Inst. Min. Eng.—Transactions of the American Institute of Mining Engineers. *Philadelphia.*

Trans. Amer. Phil. Soc.—Transactions of the American Philosophical Society held at Philadelphia for promoting Useful Knowledge. *Philadelphia.*

Trans. Amer. Soc. Civ. Eng.—Transactions of the American Society of Civil Engineers.

Trans. Barrow Nat. Club.—Transactions [or Annual Report and Proceedings] of the Barrow Naturalists' Field Club. *Barrow-in-Furness.*

Trans. Bedfordsh. Nat. Hist. Soc.—Abstract of Proceedings and Transactions of the Bedfordshire Natural History Society and Field Club. *Bedford.*

Trans. Bot. Soc. Edin.—Transactions and Proceedings of the Botanical Society of Edinburgh. *Edinburgh.*

Trans. Camb. Phil. Soc.—Transactions of the Cambridge Philosophical Society. 4to. *Cambridge.*

Trans. Cardiff Nat. Soc.—Report and Transactions of the Cardiff Naturalists' Society. *Cardiff.*

Trans. Chesterf. Derbysh. Inst. Eng.—Transactions of the Chesterfield and Derbyshire Institute of Engineers.

Trans. Clifton Coll. Sci. Soc.—Transactions of the Clifton College Scientific Society. *Clifton* (*Bristol*).

Trans. Conn. Ac. Sci.—Transactions of the Connecticut Academy of Arts and Sciences. *Newhaven* [*U. S.*]

Trans. Cumb. Assoc.—Transactions of the Cumberland Association for the Advancement of Literature and Science. *Carlisle.*

Trans. Devon. Assoc.—Transactions of the Devonshire Association for the Advancement of Science, Literature, and Art. *Plymouth.*

Trans. Edin. Geol. Soc.—Transactions of the Edinburgh Geological Society. *Edinburgh.*

Trans. Geol. Soc. Glasg.—Transactions of the Geological Society of Glasgow. *Glasgow.*

Trans. Hist. Soc. Lanc. Chesh.—Transactions of the Historical Society of Lancashire and Cheshire. *Liverpool.*

Trans. Inst. Surv.—Transactions of the Institution of Surveyors. *London.*

Trans. Kansas Ac. Sci.—Transactions of the Kansas Academy of Science. *Topeka, Kansas.*

Trans. Leicester Lit. Phil. Soc.—Transactions of the Leicester Literary and Philosophical Society. *Leicester.*

Trans. Linn. Soc.—Transactions of the Linnean Society. 4to. *London.*

Trans. Manch. Geol. Soc.—Transactions of the Manchester Geological Society. *Manchester.*

Trans. Nat. Hist. Soc. Northumb. Durham.—Transactions of the Natural History Society of Northumberland and Durham. *Newcastle-on-Tyne.*

Trans. N. Engl. Inst. Eng.—North of England Institute of Mining and Mechanical Engineers.—Transactions. *Newcastle-on-Tyne.*

Trans. Norfolk Nat. Soc.—Transactions of the Norfolk and Norwich Naturalists' Society. *Norwich.*

Trans. Nov. Scot. Inst.—Transactions of the Nova Scotian Institute of Natural Science. *Halifax, N. S.*

Trans. N. Zealand Inst.—Transactions and Proceedings of the New Zealand Institute. *Wellington.*

Trans. Plymouth Inst.—Annual Report and Transactions of the Plymouth Institution and Devon and Cornwall Natural History Society. *Plymouth.*

Trans. R. Geol. Soc. Cornw.—Transactions of the Royal Geological Society of Cornwall. *Penzance.*

Trans. R. Irish Ac.—Transactions of the Royal Irish Academy. 4to. *Dublin.*

Trans. R. Soc. Edin.—Transactions of the Royal Society of Edinburgh. 4to. *Edinburgh.*

Trans. R. Soc. Vict.—Transactions and Proceedings of the Royal Society of Victoria. *Melbourne.*

Trans. Watford Nat. Hist. Soc.—Transactions of the Watford Natural History Society and Hertfordshire Field Club. *Watford and Hertford.*

Trans. Wisconsin Ac. Sci.—Transactions of the Wisconsin Academy of Sciences, Arts, and Letters. *Madison.*

Trans. Woolhope Field Club.—Transactions of the Woolhope Naturalists' Field Club. *Hereford.*

Trans. Zool. Soc.—Transactions of the Zoological Society of London. 4to. *London.*

Verh. k.-k. geol. Reichs.—Verhandlungen der kaiserlich-königlichen geologischen Reichsanstalt. *Vienna.*

Verh. nat. Ges. Basel.—Verhandlungen der naturforschenden Gesellschaft in Basel. *Basle.*

Verh. Nat. Ver. Brünn.—Verhandlungen des Naturforschenden Vereins zu Brünn. *Brünn.*

Verh. nat. Ver. Carlsruhe.—Verhandlungen des naturwissenschaftlichen Vereins in Carlsruhe. *Carlsruhe.*

Verh. nat. Ver. preuss. Rheinl.—Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westfalens [including *Sitzungsberichte* and *Correspondenz-Blatt*]. *Bonn.*

Verh. Ver. nat. Unt. Hamburg.—Verhandlungen des Vereins für naturwissenschaftliche Unterhaltung zu Hamburg. *Hamburg.*

Verh. Würzb. phys.-med. Ges.—Verhandlungen der physikalisch-medicinischen Gesellschaft in Würzburg. *Wurtemberg.*

Versl. Med. Kon. Ak. Wet.—Verslagen en Mededeelingen der Koninklijke Akademie van Wetenschappen. *Amsterdam.*

Vid. Medd. Nat. Foren. Kjöbenhavn.—Videnskabelige Meddelelser fra den Naturhistoriske Forening i Kjöbenhavn. *Copenhagen.*

Vierteljahrsschrift nat. Ges. Zürich.—Vierteljahrsschrift der naturforschenden Gesellschaft in Zürich. *Zurich.*

Wilts. Arch. Nat. Hist. Mag.—The Wiltshire Archæological and Natural History Magazine, published under the direction of the Society founded in that county. *Devizes.*

Wochenschr. österr. Ing.- Arch.-Ver.—Wochenschriften des österreichische Ingenieur- und Architekten-Vereins. 4to. *Vienna.*

W. Rev. Sci.—The Western Review of Science and Industry. *Kansas City, Mo.*

Zapiski Imp. S. Peterb. Min. Obsch.—Zapiski Imp. S. Peterburgskago Mineralogitcheskago Obschestva. [Notices of the Imperial Mineralogical Society of St. Petersburg.] *St. Petersburg.*

Zapiski Novoruss. Obsch. Estest.—Zapiski Novorussiiskago Obschestva Estestvoispitatelei. [Notices of the New Russia Naturalists' Society.] *Odessa.*

Zeitsch. allgem. österr. Apothek-Ver.—Zeitschrift des allgemeinen österreichischen Apothek-Vereins. *Vienna.*

Zeitsch. Bauwesen.—Zeitschrift für Bauwesen. *Berlin.*

Zeitsch. Berg-Hütt. Salinenw.—Zeitschrift für das Berg-, Hütten- u. Salinenwesen im preussischen Staate. 4to. *Berlin.*

Zeitsch. Berg-Hütt. Ver. Kärnten.—Zeitschrift des Berg- und Hüttenmännischen Vereins für Steiermark und Kärnten. *Klagenfurt.*

Zeitsch. deutsch. geol. Ges.—Zeitschrift der deutschen geologischen Gesellschaft. *Berlin.*

Zeitsch. deutsch. österr. Alpenver.—Zeitschrift des deutschen und österreichischen Alpenvereins. *Munich.*

Zeitsch. gesammt. Nat.—Zeitschrift für die gesammten Naturwissenschaften. Originalabhandlungen und monatliches Repertorium der . . . Geologie, Oryktognosie, Palæontologie . . . *Berlin.*

Zeitsch. Kryst. Min.—Zeitschrift für Krystallographie und Mineralogie, unter Mitwirkung zahlreicher Fachgenossen des In- und Auslandes. *Leipzig.*

Zeitsch. österr. Ing.- Arch.- Ver.—Zeitschrift des österreichischen Ingenieur- und Architekten-Vereins. Fol. *Vienna.*

ERRATA.

P. 1, line 13, *for* grits *read* pits.

P. 6, line 9, *for* Graphite *read* Gryphite.

„ line 13, *for* rock *read* rocks.

P. 25, line 8 from foot, *for* 19, 23 *read* 19–23.

P. 27, line 11, *for* **David** *read* **Daniel.**

P. 28, line 2 from foot, *add* In full *Trans. R. Soc. Edin.* vol. xxviii. p. 93.

P. 38, line 23, *for* British *read* Bristol.

P. 52, line 17, *add* Full work, pp. 144, 7 pls. 4to. *Rome.*

P. 56, line 19 from foot, *add* For Italian version see p. 197.

P. 58, line 14, *for* Prandel's *read* Prendel's.

„ lines 16, 17, *for* Noeverhaugens *read* Næverhougens.

P. 63, line 6 from foot, *for* **S** *read* **G.**

P. 64, line 3, *for* 355 *read* 345.

P. 76, line 20 from foot, *for* Bd. xi. *read* Bd. ix.

P. 77, line 11 from foot, *for* areas *read* cores.

P. 79, line 19 from foot, *for* kinds *read* finds.

P. 82, line 13 from foot *for* gelogjai *read* geologjai.

„ line 12 from foot, *for* eredanénye *read* eredménye. [Report of Progress of R. Hungarian Geol. Inst. in 1876.]

P. 87, line 24, *for* Stanislan *read* Stanislau.

P. 92, line 20, *for* 502, 503 *read* 592, 593.

P. 105, line 19, and p. 109, line 24, *for* J. S. D. *read* J. P. D.

P. 107, **Fontannes.** Cancel part i., previously entered; and to part ii. add *Ann. Soc. Agric. Lyon*, t. ix.

P. 108, line 3 from foot, *for* lxxxiii. *read* lxxxii.

P. 109, Cancel **Helmersen**, entered p. 72.

P. 127, line 9 from foot, *for* Joughiogheny *read* Youghiogheny.

P. 132, line 14 from foot, *for* Shekapee *read* Shakopee.

P. 133, line 6, *add* vol. xix. p. 47.

P. 137, line 3, *for* **Poter** *read* **Porter.**

P. 140, line 2 from foot, *for* Barakur *read* Barákar.

P. 145, last line, *for* Kuen-lun *read* Kuen-luen.

P. 146, line 9, after *Nat.* add vol. xi.

P. 149, line 22, *for* J. D. *read* J. P. D.

P. 155, line 11, *for* Matai *read* Maitai.

P. 158, line 17, *for* Oamara *read* Oamaru.

P. 159, line 9 from foot, *for* copper, pyrites *read* copper-pyrites.

P. 178, *for* **Heinrich** *read* **Henrich.**

P. 190, **Meade**, transfer the titles of 3 papers of the series, misplaced in abstract, to their place before *Min. Journ.*

P. 206, line 3 from foot, *for* Viel Saln *read* Viel-Salm.

P. 224, line 17 from foot, *for* Gozo *read* Gozzo.

P. 228, line 2, *for* Amhurst *read* Amherst.

P. 231, line 19 from foot, *for* Hermannotite *read* Hermannolite.

P. 232, lines 6, 9, 10, *for* boric *read* boracic.

P. 239, line 13, *for* Hexaganit *read* Hexagonite.

„ line 18, *add* Abstract in English, *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vii. pp. 9–11.

P. 248. Last two entries under **Vom Rath,** cancel the German titles, and for references give *Verh. nat. Ver. preuss. Rheinl.* Jahrg. xxxiv. *Sitz.* pp. 193 and 195 respectively.

P. 267. The first 4 entries under **Vom Rath** have no titles in the original, being remarks in meeting.

P. 332, line 2 from foot, the reference should be *Verh. nat. Ver. preuss. Rheinl.* Jahrg. xxxii. *Sitz.* pp. 27–31.

P. 351, line 21 from foot, *for* coal *read* cave.

P. 357, line 9, *for* stnalP *read* Plants.

P. 363, line 19 from foot, *for* Nurshan *read* Nurschan.

THE

GEOLOGICAL RECORD

FOR 1877.

STRATIGRAPHICAL AND DESCRIPTIVE GEOLOGY.

1. *BRITISH ISLES.*

Sub-Editor W. Topley, F.G.S., Assoc. Inst. C.E.

Adams, William. On the Penarth or Rhætic Beds of Glamorganshire, Leicestershire, &c. *Trans. Cardiff Nat. Soc.* vol. viii. pp. 96–98.

Notes on some of the places where these beds can be examined.

Anon. Excursion to Grays, Essex. *Proc. Geol. Assoc.* vol. v. no. 3, p. 125.

A notice of chalk and brick-earth grits.

——. Parkfield Fossil Forest. *Proc. Dudley Geol. Soc.* vol. 3. no. 5, pp. 128, 129 (map and section).

Extracts from papers by **W. Ick** and **H. Beckett** (Geol. Soc. 1845). Site near Wolverhampton.

——. On the Contents of a Hyæna's Den on the Great Doward, Whitchurch, Ross. *Proc. Dudley Geol. Soc.* vol. 3. no. 5, p. 138.

Extract from paper by **Rev. W. S. Symonds,** 1871. Section and list of fossils.

——. Human Remains in a Raised Beach. *Nature,* vol. xvi. pp. 52–53.

At Pittenweem, Fife; 4½ feet above high-water mark.

——. [**G. G.**] Indications of the Ice-Age in Shetland. *Nature,* vol. xvi. p. 501.

Gives instances of glacial markings.

——. The Boring at Messrs. Meux's Brewery. *Journal of Gas-Lighting and Water Supply,* vol. xxix. p. 972 (reprinted on a folio sheet).

4

A description of the work and of the rocks traversed; with a vertical section of strata, scale 70 feet to 1 inch.

Anon. [**J. Gunn.**] Geological Excursion to Mundesley and Happisburgh. *Eastern Daily Press*, Feb. 15.
Notes on Mundesley Freshwater-bed and Forest-bed.

——. [Norfolk Drift.] *Norfolk Chronicle*, Feb. 17. (Norwich Geol. Soc.)
Letter from **Dr. James Geikie**; remarks by **Messrs. Harmer** and **Gunn**; account of excursion to Mundesley and Happisburgh.

——. [**T. H. W.**] A Week's Holiday. *Nat. Hist. Journ.* vol. i. no. 5, pp. 75–77.
Notes on the Geology of N.W. Yorkshire (Settle district).

——. The Sub-Wealden Exploration. *Coal and Iron Trades Gazette*, no. 142, p. 637.
Gives a review of some of the results of the exploration.

——. The Kilsyth Coalfield. *Coll. Guard.* vol. xxxiii. p. 213.
Notes the discovery of a seam of gas-coal about 2 inches thick near Twechar, in the same position as the Lesmahagow Coal.

——. Discovery of Coal near Darlington. *Coll. Guard.* vol. xxxiii. p. 251. (From *Newcastle Chronicle.*)
Gives a section of the beds passed through at Windlestone.

——. Discovery of Coal. *Coll. Guard.* vol. xxxiii. p. 292.
The Top Hard Coal has been proved at Pleasley, Nottinghamshire, at a depth of 515 yards.

——. Newport Abercarn Black-Vein Steam Coal (Celynen, Merthyr). *Coll. Guard.* vol. xxxiii. p. 415.
A description of the coal and an analysis by **T. Coomber.**

——. Important Discovery of Coal in Durham. *Coll. Guard.* vol. xxxiii. p. 646.
About a mile S.E. of Wingate. A section of the seam given.

——. New Iron Mines. *Coll. Guard.* vol. xxxiv. p. 133.
Mentions explorations for hæmatite in the Furness and Cumberland iron-district.

——. New Seam of Coal in Northumberland. *Coll. Guard.* vol. xxxiv. p. 424.
140 yards from the surface, at Cooper Eye, 2 miles from Berwick.

——. A New Coal-field. *Coll. Guard.* vol. xxxiv. p. 738.
At Monckton Main; the seam (the Barnsley Coal) was found at a depth of 470 yards.

Appleton, E. Encroachment of the Sea at Westward Ho. *Trans. Devon. Assoc.* vol. ix. pp. 227–233.

Describes the waste effected along the pebble-ridge, and the writer's views as to the measures necessary to prevent it.

Argyll, Duke of. On the Physical Structure of the Highlands in connexion with their Geological History. *Rep. Brit. Assoc.* for 1876, *Sections*, pp. 81–87.

States, in eighteen propositions, the geological history of the Highlands. Argues against the theory of an ice-sheet. Gives reasons for believing that the land sank 2000 feet during the Glacial period, and was re-elevated to the same amount. Describes raised beaches on the W. coast of Jura, of very recent geological date. W. T.

Armstrong, J., and **John Young.** Notes on the Fossils of the Orchard Limestone Series. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 250–261.

The Orchard limestone is described; it lies at the base of the Upper Limestone series in the Coal Basin of the Clyde. A catalogue of the Orchard Fossils, arranged zoologically, includes the names of 66 genera and 120 species. R. B. N.

Aveline, W. T. The Magnesian Limestone and New Red Sandstone in the Neighbourhood of Nottingham. *Geol. Mag.* dec. ii. vol. iv. pp. 155, 156, 380.

The Bunter overlaps in succession each of the 4 members of the Permian, and finally rests on the Coal Measures. There is no passage from the Permian to the Trias. The break between the Coal Measures and the Permian is greater than that between the Permian and the Trias. W. T.

Bailey, T. H. Perry Sinkings. *Proc. Dudley Geol. Soc.* vol. 3. no. 4, p. 100.

Shaft being sunk through Drift and red calcareous rock and marl (Permian or U. Coal Measures).

Barrow, George. On a new Marine Bed in the Lower Oolites of East Yorkshire. *Geol. Mag.* dec. ii. vol. iv. pp. 552–555.

This bed is best seen at Walk-Mill Force, in Eller Beck, near Goathland, on the Whitby and Pickering Railway; beds of shale, sandstone, and ironstone occur, the last with many marine fossils, especially *Pholadomya* and *Myacites*. Its position is about 120 feet above the top of the U. Lias. In Winter Gill, 5 miles W., the beds are thicker, and the ironstone beds have a considerable horizontal range, thinning N. and E., but thickening S. and W., and forming a thin but persistent wedge over the whole of the E. Yorkshire area. A. J. J-B.

Beaumont, [Major] Frederick. The Water Supply of London. *Daily News*, April 21.

Note on the boring in Tottenham Court Road. The Gault was penetrated at 1001 feet, and the L. Greensand reached, when water rose with a temperature of 57° Fahr.

Beesley, Thomas. On the Geology of the Eastern Portion of the Banbury and Cheltenham Direct Railway. *Proc. Geol. Assoc.* vol. v. no. 4, pp. 165–185; 2 woodcuts.

The railway runs over M. and U. Lias, Inf. Oolite, Gt. Oolite (with Forest Marble), and Cornbrash: these formations are described, and some detailed sections are given. There are lists of fossils from the U. Lias, Inf. Oolite (zone of *Ammonites Murchisonæ*), Gt. Oolite, and U. Estuarine series of Hooknorton; Gt. Oolite and Forest Marble near Great Rolbright; and M. Lias (zones of *Amm. margaritatus* and *Amm. capricornus*) of Chipping-Norton Tunnel. W. T.

——. The Lias of Fenny Compton, Warwickshire. 8vo. *Banbury.* Pp. 16. Reprinted from the *Banbury Guardian.* Also in *Proc. Warwicksh. Nat. Field Club.* 1877, p. 1–21 (1878).

A description of the section and a list of 207 species found; especial attention is given to the Ammonite zones.

Bell, Dugald. Notes on Glacial Mounds near Balquhidder, Perthshire. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 234–236.

The mounds are heaped up in such a way as to show a divergence of the ice in opposite directions. Other sets of like mounds occur in side glens which show a curving of the ice. These mounds belong to a later stage than the ice-sheet, when it had given way to local glaciers. W. W.

Belt, Thomas. On the First Stages of the Glacial Period in Norfolk and Suffolk. *Geol. Mag.* dec. ii. vol. iv. pp. 156–158.

After the growth of the Cromer Forest Bed the North Sea was partly blocked on the N. by ice, the Straits of Dover not then existing; in the freshening water thus formed the fluvio-marine beds were laid down. When the ice quite blocked up the N. end of the sea, the freshwater laminated brickearths were founded. The lake overflowed at its S.W. end, cutting through the Straits of Dover. As the lake thus gradually drained, the ice advanced from the N., crumpling up the brickearth, and in some cases depositing Till below it. W. T.

——. Quartzite Implements at Brandon. *Nature*, vol. xvi. pp. 107, 162, 163.

Believes the implements to be pre-glacial; they may have been made from fragments out of U. Greensand.

Binney, E. W. Old Oak Trees. *Trans. Manch. Geol. Soc.* vol. xiv. p. 283.

Refers to trunks of oak trees, as indicating changes in the old course of the Irwell.

Black, Dr. W. T. On Rolled Pebbles from the Beach at Dunbar. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 122, 123, woodcut; and *Trans. Manch. Geol. Soc.* vol. xiv. pp. 235, 236.

Shows by diagrams the formation and travelling of pebbles and the mode of accumulation of shingle-beaches, giving measurements of 4 typical forms of pebbles. W. H. D.

Blake, Rev. J. F., and W. H. Hudleston. The Corallian Rocks of England. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 260–405, pls. xii.–xvii. (1 of comparative sections, 5 of fossils); 22 woodcuts.

The beds are described in order from Weymouth to Yorkshire. The districts into which the area is divided, and the typical sections given in each, are as follows:—*Weymouth*: Sandsfoot and Nothe, Osmington, Abbotsbury. *N. Dorset*: Sturminster. *N. Wilts, Berks, and Oxfordshire*: Westbury, Calne, Highworth, Oxford. *Cambridgeshire*: Upware. *Yorkshire Basin*: N. Grimston, Malton, Hambleton, Newtondale, Forge Valley. These districts, of very unequal sizes, are separable by original form and character, as well as by subsequent denudation. When complete the beds are as follows, in ascending order:—1. *L. Calcareous Grit*; 2. *L. Limestone*, or *Hambleton Oolite*, probably represented at Sturminster by the oolites which underlie the pisolites, and at Weymouth by the Nothe Clays; 3. *M. Calcareous Grit*, perhaps represented at Weymouth by the Bencliff Grits; 4. *Coralline Oolite*; 5. *Coral Rag*; 6. (in 2 divisions) *Supracoralline Beds*. 1, 2, 3 form the Lower group, 4 and 5 the Middle Group, 6 the Upper Group. At Newtondale the whole Corallian Series, between the Oxford and Kimmeridge Clays, is 305 feet thick, at Weymouth 230 feet, at Calne only 80 feet. Lists of fossils are given. Analysis of the Abbotsbury granular ironstone (p. 275). For new fossils see *post*, INVERTEBRATA and PLANTS. W. T.

Blake, J. H. On the Age of the Mammalian Rootlet bed at Kessingland [Suffolk]. *Geol. Mag.* dec. ii. vol. iv. pp. 298–300.

The Kessingland rootlet bed is continuous with like beds at Hasbro' and Runton, where it is seen to be beneath the Glacial Series of Messrs. Wood and Harmer. W. H. D.

Bonney, Rev. T. G. The Coral Rag of Upware. *Geol. Mag.* dec. ii. vol. iv. pp. 476, 477.

Corrects the remarks of Messrs. Blake and Hudleston (see above).

——. Colouring of Oolitic Rocks. *Geol. Mag.* dec. ii. vol. iv. p. 576.

Calls attention to the fact that an excellent illustration may now be seen in a cutting on the Midland Railway to the north of Kettering.

Breese, B. S. Forest Bed of East Norfolk. *Geol. Mag.* dec ii. vol. iv. p. 432.

Below the Gut at Hasbro' the stumps of trees are rooted upright in hard clay; they must have grown on the spot.

Bryce, Dr. Jas. On the Granite of Strath-Errick, Loch Ness. *Rep. Brit. Assoc.* for 1876, *Sections*, p. 87.

The granite here is eruptive through the Old Red Sandstone.

Buckman, Prof. J. The Cephalopoda-Beds of Gloucester, Dorset, and Somerset. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 1–9; 2 woodcuts.

The so-called U. Lias Sands lie at 2 horizons; those of Gloucestershire underlie all the Inf. Oolites; those of Dorset and Dundry Hill are at the top of that formation, and represent the Graphite Grit of Leckhampton. Lists of fossils are given. W. T.

Burns, D. Lecture on Geology, and its Explanation of Certain Phenomena in Alston Moor. *Alston Herald*, Feb. 3, 10.

Sketches the history of the Carboniferous rock; refers to the Whin Sill as intrusive; describes the physical geography and denudation of the district. W. T.

Callaway, C. On a New Area of Upper Cambrian Rocks in South Shropshire, with a Description of a new Fauna. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 652–672; sketch map, section, and pl. xxiv. (Shincton fossils).

Describes the L. Palæozoic rocks between Wellington and Kenley, and a smaller area at Lilleshall. The rocks have generally been classed as Caradoc, except the May Hill Sandstone at Kenley. Gives the following succession:—May Hill Sandstone = *U. Llandovery* of Murchison; Chatwall Sandstone, Harnage Shales, and Hoar Edge Grits = *Caradoc*; Shineton Shales, 1500 feet thick, = *Tremadoc*. The May-Hill Sandstone successively overlies, and is clearly unconformable to, all the lower beds. The Shincton Shales, containing *Dictyonema sociale*, are correlated with the Dictyonema-shales of Pedwardine and Malvern; the black Olenus-shales of Malvern are apparently not represented at Shincton; but the Hollybush Sandstone is. For new species see *post* under INVERTEBRATA. W. T.

——. Longmynd Rocks. *Nature*, vol. xv. p. 313.

The Longmynd Rocks near Shrewsbury are not overlain by Lingula Flags. The Stiper Stones Beds are probably Arenig.

Carter, Richard. Chairman's Address, with Observations on the Mineral Aspects of the West-Riding Coalfield. *Proc. Geol. Soc. W. R. Yorksh.* n. ser. pt. iii. pp. 113–122.

Divides the coalfield by an E. and W. line coincident with the Calder Valley, and notes the correlation of seams on both sides. Notices various rock-beds and coal-seams, and the extension of the area worked. W. W.

Clarke, J. E. (J. E. C.) Ancient Boulder Gravels. *Nat. Hist. Journ.* vol. i. no. 7, p. 120.

Describes the Permian conglomerates in the new railway-cutting near Walsall.

Clinch, G. On the Post-Glacial Deposits of the Thames Valley. *Sci. Goss.* no. 154, p. 224.

Regards the valley as produced by a glacier ploughing out the Chalk, the river subsequently depositing the brickearth, gravel, &c. in vertical succession on its bed. [The L. Tertiaries are ignored.] W. H. D.

Cole, —. Section of Wren's Nest Hill, [Dudley]. *Proc. Dudley Geol. Soc.* vol. 3. no. 4, p. 78.

Section of anticlinal in Wenlock Shale and Limestone.

Collins, J. H. On the Trelissick Elvan, with a Proposed Classification of the Cornish Elvans. *Trans. R. Geol. Soc. Cornw.* vol. v. pt. 4, pp. 221–228; plate of rock-sections.

There are three distinct types of intrusive rocks, according to their mineralogical composition—Elvanyte, Trelaveryte, and Trelissickyte. A series of analyses, by **Mr. J. A. Phillips** and the author, is given, illustrating the chemical composition of these related rocks, together with that of Cornish Granite. R. B. N.

Corder, H. An Ancient Flint Implement. *Nat. Hist. Journ.* vol. i. no. 6, pp. 97, 98; no. 7, p. 120.

A Neolithic spearhead found in disturbed gravel at Chelmsford. States the origin of the Glacial and Post-glacial gravels of Essex.

Craig, R. Remarks upon the Bed of Dolerite which crosses Renfrewshire to the East of Paisley. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 270–275.

Notes the strata underlying the dolerite as shown by a bore put down at Saucel.

——. Notes upon a Shell Bed at the West end of Arkleston Tunnel, near Paisley. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 320–322. With remarks by **Mr. John Young** and **Mr. James Thomson.**

The shell-bed lies in a hollow of the boulder clay. The shells occur in all parts of the bed, but more abundantly in thin bands of muddy sand intercalated with it. R. B. N.

Crofton, Rev. Addison. Old oak trees in the bed of the Irwell, at Burksbottoms. *Trans. Manch. Geol. Soc.* vol. xiv. pp. 238–245.

Water-worn trunks found in an excavation for gasworks, in gravel and sand of the alluvial flat.

Crosskey, Rev. H. W. Fourth Report of the Committee appointed for the purpose of recording the position, height above the sea, lithological characters, size, and origin of the more important of the Erratic Blocks of England and Wales, reporting other matters of interest connected with the same, and taking measures for their preservation. *Rep. Brit. Assoc.* for 1876, pp. 110–114.

Records boulders at Langtree, Devonshire, by **G. Doe**; Wolvercote, near Oxford, by **Prof. Prestwich**; Harborne, near Birmingham, by

Dr. Deane and **Rev. H. W. Crosskey**; Bootle, Lancashire, by **G. H. Morton**, who also gives a section of the Drift there (see GEOLOGICAL RECORD for 1876, p. 27); Bothel, N. Cumberland, by **Prof. Harkness**; N. Wales, by **D. Mackintosh.** W. T.

Curry, John. Is there a Base to the Carboniferous Rocks in Teesdale? *Geol. Mag.* dec. ii. vol. iv. pp. 138, 139.

From the thickness of Carboniferous Beds below the Whin Sill on W. side of the Pennine range, answers the question negatively.

Dairon, J. Notes on the Silurian Rocks of Dumfriesshire and their Fossil Remains. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 176–184, pls. i., ii.

Describes the black Graptolitic mudstones or shales of the Moffat district, accompanied by brief descriptions of several species of Graptolites, figures of which are given. The following new species are recorded and figured; but their description is deferred:—*Thamnograptus crucifer*, *Retiolites branchiatus*, and *Dicellograptus guilloche.* R. B. N.

Dakyns, J. R. On Silurian Erratics in Wharfedale. *Proc. Geol. Soc. W. Riding*, n. s. vol. i. pt. iii. pp. 159–163.

No Silurian rocks are exposed in Wharfedale. The boulders only occur in part of the dale, the rest of the drift being wholly local. It seems likely that Silurian rocks occur under the Drift below Kilnsey Crag. W. H. D.

——. Is there a Base to the Carboniferous Rocks in Teesdale? A Question for Silurian Geologists. *Geol. Mag.* dec. ii. vol. iv. pp. 58, 59, 140.

——. Exploration of Victoria Cave, Settle, Yorkshire. *Geol. Mag.* dec. ii. vol. iv. p. 285.

Bears witness to the care with which the explorations have been made.

——. On Professor Hull's Carboniferous Classification. *Geol. Mag.* dec. ii. vol. iv. pp. 312–314.

Objects to the classing the L. Coal Measures and Millstone Grit as "essentially marine," to the separation of the U. Limestone Shales (incorrectly called Yoredale Series) from the Carboniferous Limestone, and to their union with the Millstone Grit. Believes in no general classification. W. H. D.

——. A Sketch of the Geology of Keighley, Skipton, and Grassington. *Geol. Mag.* dec. ii. vol. iv. pp. 346–350. [The paper noticed under a different title in GEOLOGICAL RECORD, for 1874, p. 7.]

——. The Antiquity of Man. *Geol. Mag.* dec. ii. vol. iv. pp. 439–441.

Objects to the hypotheses proposed to disprove the Pre- or Inter-

glacial age of the lower cave-earth of the Victoria Cave. As this deposit contains mammals elsewhere associated with implements, &c., we may assume the existence of Man in or before the Glacial Period.
W. H. D.

Davey, E. C. Catalogue of Fossils from the Cretaceous Beds of Berkshire. Pp. 16. 8vo. *Wantage.*

From the author's collection. A few are new to England.

Davey, E. C., and W. H. Hudleston. Excursion to Wantage. *Proc. Geol. Assoc.* vol. v. no. 4, pp. 137–140.

Describes the Firestone, Glauconitic sands (with fossils characteristic of the Warminster Beds), L. Chalk, and Chalk-rock, here very fossiliferous. W. T.

Davies, A. T., and B. K. Kitto. On some Beds of Sand and Clay in the Parish of St. Agnes, Cornwall. *Trans. R. Geol. Soc. Cornw.* vol. ix. pt. 3, pp. 196–204, pls. iv., v. (map and section).

The sand is nearly pure silica; the clay is of two kinds, candle-clay and fire-clay. These deposits occur round the foot of St. Agnes Beacon, which is clay-slate or Killas, having a height of about 620 feet.
R. B. N.

Davies, D. C. On the Relation of the Upper Carboniferous Strata of Shropshire and Denbighshire to Beds usually described as Permian. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 10–28, pl. i. (sections).

Refers especially to rocks in N.W. Shropshire and S.E. Denbighshire. Details given of 10 sections in the N.W. of England. The plate gives 20 comparative sections (16 British and 4 Foreign) of Permian and Coal Measures, the *Spirorbis*-limestone being taken as the base of the latter. The Coal-seams of Ifton (N. Shropshire) are M. Permian, the equivalent of the Magnesian Limestone. There is no well-marked boundary line between the Permian and the Coal Measures; the change is gradual, and it is locally different. W. T.

Davis, J. W. On a Stratum of Coal containing Fish Remains in the Lower Coal Measures. *Proc. Geol. Soc. W. R. Yorksh.* n. ser. pt. iii. pp. 127–137.

This "bone-bed" rests on the Better Bed Coal (L. Coal Measures) over a tract 4 or 5 miles by nearly 2, and is less than an inch thick at the most. It is composed, in great part, of comminuted bones, chiefly of fish. The history of the deposition of the various beds is traced, and the remains found are noticed at length. The new genus *Hoplonchus* is described. W. W.

——. The Stems and Roots of Fossil Trees in the Lower Coal Measures, at Wadsley, near Sheffield. *Proc. Geol. Soc. W. R. Yorksh.* n. ser. pt. iii. p. 179.

A note on the fossil plants shown in the photograph issued with the *Proceedings* for 1876, and on the section of the beds.

Davis, William. Pouk Hill Quarry, near Walsall. *Proc. Dudley Geol. Soc.* vol. 3. no. 3, pp. 48, 49; section.

The section shows that the boss of trap is not a "neck," the underlying Carboniferous beds being continuous.

Dawkins, Prof. W. B. The Exploration of the Ossiferous Deposit at Windy Knoll, Castleton, Derbyshire, by Rooke Pennington and Prof. Dawkins. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 724–729; 3 woodcuts.

Describes further researches (see Geological Record for 1875, pp. 33, 277). The fissure first explored was traced to a basin or pocket in the limestone, which is part of a swallow-hole; it is continued downwards by a fissure, probably into a cavern now blocked up. At the bottom of the basin there is impervious loam, without bones; this supported a pool of water into which the clay with bones was washed. Considerable geographical changes have since taken place; and these are described. The bones are of bison, reindeer, bear, wolf, fox, and hare. It is probable that many of the larger animals were drowned during migration. The large proportion of young bisons confirms the conclusion that that animal inhabited the district in the summer. The smaller proportion of young reindeer shows that they were winter visitors. The deposit is probably late Pleistocene. W. T.

De Rance, C. E. The Superficial Geology of the Country adjoining the Coasts of South-west Lancashire. *Geological Survey Memoir.* Pp. v, 139. 8vo. *London.* Price 17*s*.

Includes some previously published memoirs (see Geological Record for 1875, p. 11) and abstracts of the more important papers on the district. Describes in detail the physical geography, the Glacial, Postglacial, and Recent deposits, giving a list of glacial striations. Remarks on Roman and other antiquities, on the agricultural and economic geology, on water-supply, and on the action of tidal currents. The list of fossils (130 species), revised by **R. Etheridge**, shows the distribution in local Glacial, Postglacial, and Recent deposits, in the English and Belgian Crags, and in the Drifts of Scotland, Yorkshire, Cheshire, and Wales. W. H. D.

——. On the Variation in Thickness of the Coals and Measures of the Lancashire Coalfield. *Trans. Manch. Geol. Soc.* vol. xiv. pp. 207–220 and 245–249; and *Rep. Brit. Assoc.* for 1876, *Sections*, p. 89.

Describes the Wigan coal-basin as a contemporaneous synclinal of deposition, and not of subsequent movement, the measures thickening towards the centre of the basin, 50 feet in a mile. The aggregate thickness of the coal-seams is not governed by this law, being 94·7 feet at Prescot on the S.W. edge of the basin, only 79·5 at the centre, and 52·7 on the N.E. edge at Burnley. C. E. R.

——. Second Report of the Committee for investigating the circulation of the Underground Waters in the New Red Sandstone and Permian Formations of England, and the quantity and character of the water supplied to various towns and districts from these Formations. *Rep. Brit. Assoc.* for 1876, pp. 95-109.

Details of several wells given (sometimes with analyses), chiefly in New Red Sandstone. Only a very small proportion of the available water in this formation is yet utilized. An appendix gives analyses of New Red water, reprinted from Sixth Report of River Pollution Commission (see GEOLOGICAL RECORD for 1875, p. 200). W. T.

Dickinson, Joseph. The Ifton Rhyn Coalfield, Shropshire. *Trans. Manch. Geol. Soc.* vol. xiv. pp. 189, 190.

Refers this field to the horizon of the lower part of the Staffordshire U. Coal Measures, and differs from Mr. Davies, who considers these coals to be Permian. C. E. R.

Durham, James. The Kames in the Neighbourhood of Newport, Fife, N.B. *Geol. Mag.* dec. ii. vol. iv. pp. 8-13, pl. i. (map).

The Kames consist of far-travelled material, brought down by glaciers into the sea, and there rounded and formed into a plateau, 200 feet above the present sea-level. This plateau has been denuded sub-aërially into kames. It terminates in a steep cliff, the base of which is 150 feet above the sea. W. H. D.

——. Hog-Wallows and Prairie Mounds. *Nature*, vol. xvi. p. 24.

Etheridge, Robert, and **James Plant.** Report on the probability of finding Coal under the Estate of "the Evington Coal Boring Company, Limited," at Evington, near Leicester. Pp. 4. Fol. Privately printed.

Mr. Etheridge says that the Humberstone borehole had been carried 200 feet into the "Waterstones" (Keuper), which appear to be highly inclined; this feature is not false-bedding, the vertical thickness and constancy in the dip being against this view. Probably at least another 500 feet must be added to the thickness of the New Red at Humberstone before other rocks would be reached. There is reason to believe that the older rocks (more probably the Coal Measures than any other) do not lie deeper than 2000 feet.

Mr. Plant states reasons for concluding that the upthrow of the older Charnwood rocks was post-Carboniferous, that, as the coal-field extends over from the W. side and is known to be of full thickness close to that side, and as the Nottinghamshire coal-field, also in full thickness, approaches from the N., there is every reason for concluding that this E. district is part of one common coal area. Considers the apparent inclination in the Keuper beds to be false-bedding. Concludes that 1200 feet will be the proper depth to fairly test the existence of Coal Measures. H. B. W.

Evans, Caleb. On the Forms of the Genus *Micraster* common in the Chalk of West Kent and East Surrey. *Proc. Geol. Assoc.* vol. v. no. 4, pp. 149-154, pl. ii.

Corrects his previous classification (in which *Micraster cor-testudinarum* was described as *M. cor-anguinum*), and proposes the following zones (ascending order):—zone of *Holaster trecensis* and *Ammonites varians*, Chalk Marl and Grey Chalk (Chalk of Oxtead); of *Belemnitella plena*, yellow concretionary Chalk and hard White Chalk (Chalk of Marden Park); of *Inoceramus mytiloides* (*labiatus*), White Chalk without flints (U. Chalk of Marden Park); of *I. Brongniarti* and *Terebratulina gracilis*, White Chalk with few flints (Chalk of Whiteleaf): of *Holaster planus* and *Micraster cor-bovis*, lowest beds of Chalk with bands of flint nodules (L. Chalk of Kenley); of *M. cor-testudinarum*, Chalk with bands of flint (Chalk of Riddlesdown, or U. Chalk of Kenley and Purley); of *M. cor-anguinum* and *Echinoconus conicus* (*Galerites albogalerus*), Chalk with bands of flints (Chalk of Croydon and Charlton). The Chalk of Gravesend is probably slightly higher than this (see *post* under INVERTEBRATA). W. T.

Evans, Caleb. Excursion to Hampstead. *Proc. Geol. Assoc.* vol. v. no. 4, pp. 160, 161.

Describes the geology of the country.

Evans, John. The Hertfordshire Bourne. *Trans. Watford Nat. Hist. Soc.* vol. i. pt. 6, pp. 137–140.

Describes this intermittent river, which rises (at intervals of three to seven years) between Watford and Tring; parts of its course are underground. W. H. D.

——. Anniversary Address. *Trans. Watford Nat. Hist. Soc.* vol. i. pt. 7, pp. 187–200.

Describes the implement-yielding gravels of S.E. England and N.W. France, with remarks on the mode of their formation. W. H. D.

Evans, T. F. The Mines of the Parys Mountain, Anglesea. *Trans. Manch. Geol. Soc.* vol. xiv. pp. 357–372, 395–402.

These copper mines were opened in 1768 in a narrow strip of Silurian rocks, occurring amongst altered Cambrian. Their strike is crossed by the great quartz Carregydoll Lode, 5 to 60 feet in width, with a little copper; but ore of the value of a million sterling was taken from the adjacent North Discovery Lode and underlying felstone. C. E. R.

Evans, Walter. A description of the sinking through the quicksand and other deposits overlying the metals at Royton, Lancashire. *Trans. Manch. Geol. Soc.* vol. xiv. pp. 178–186.

Gives details of 177 feet through Drift, bands of marl alternating with sand and gravel, 500 feet above the sea.

Ferguson, William. On the Occurrence of Chalk Flints and Greensand Fossils in Aberdeenshire. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 112–121.

Describes a bed of flints in clay capping the hills from Peterhead southward to the Ythan. They contain many fossils. Notices the older rocks of the district (granite, Silurian, &c.) and their minerals. Describes the Crag (?) sands of Slains and the Greensand of Cruden, and discusses the evidence as to the former existence of Secondary rocks in that part of Scotland. W. H. D.

Fisher, Rev. O. Forest Bed at Happisburgh. *Geol. Mag.* dec. ii. vol. iv. p. 479.

Doubts the continuity of the Hasbro' forest bed with that of Cromer.

——. *Elephas meridionalis* in Dorset. *Geol. Mag.* dec. ii. vol. iv. p. 527.

There are in the Blackmore Museum, Salisbury, two teeth labelled as from Dewlish, Dorset. As this is the pre-glacial species, further information is asked for. W. T.

——. The Antiquity of Man. *Nature*, vol. xvi. p. 182.

If glaciation of E. Anglia has occurred since its human occupation, the product of this is what the author described, in 1866–68, as "trail."

Fordham, G. H. The Term "Chloritic Marl." *Geol. Mag.* dec. ii. vol. iv. p. 191.

Asks for information as to the "true typical Chloritic Marl."

Foster, Dr. C. Le N. Remarks on some Tin Lodes in the St. Agnes District. *Trans. R. Geol. Soc. Cornw.* vol. ix. pt. 3, pp. 205–219, pls. vi.–xi. (diagrammatic sections).

Describes the Pink Lode of Penhalls Mine, the Kitty or Pryor's lode of Wheal Kitty, the Towanrath lode at Wheal Coates, and the section at Cligga. R. B. N.

Gardner, J. S. On the Lower Bagshot Beds of the Hampshire Basin. *Proc. Geol. Assoc.* vol. v. no. 2, pp. 51–68, plate and woodcuts; *Nature*, vol. xv. pp. 279, 280; and *Geol. Mag.* dec. ii. vol. iv. pp. 129–135.

——. On the Eocene Flora of Bournemouth. *Nature*, vol. xvii. pp. 47, 48.

Divides the L. Bagshots of the Hampshire coasts into three:—Lower Freshwater, 200 ft. thick; Middle Freshwater, 300 ft.; Marine, 400 to 500 ft. The M. Freshwater beds are richest in leaves, which occur in clay beds, mostly of small extent and containing a distinctive flora, indicating that the plants cannot have been drifted far. The vertical succession gives evidence of a gradual change from an upland to a swamp flora. Above the beds containing leaves there are fruits identical with those of the London Clay. Many of the plants also occur at Bovey Tracy; and the question of the age of this deposit may have to be reconsidered. W. T

——. On the Tropical Forests of Hampshire. *Nature*, vol. xv.

pp. 229–232, 258–260, woodcuts; and *Geol. Mag.* dec. ii. vol. iv. pp. 23–26.

Lectures at Loan Exhibition, S. Kensington.

Gardner, J. S. The Tropical Forests of Hampshire. *Geol. Mag.* dec. ii. vol. iv. pp. 137, 138.

Reply to **S. V. Wood, Jun.** (see p. 43). The leaves cannot have drifted far. The intermixture of subtropical and temperate forms may be due to oscillations of climate or to the existence of a mean annual temperature of small range. W. T.

——. The Red Clay of the Deep-sea and the Gault Deposits. *Geol. Mag.* dec. ii. vol. iv. p. 377.

The Gault is a shallow-water deposit, gradually changing to the deeper-water deposit of the Grey Chalk sea. W. T.

Geikie, Prof. A. Recent Researches into the history of the Deposits known as the Old Red Sandstone. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 276–281 (abstract).

Describes the Old Red Sandstone in the British Isles under its three divisions of Lower, Middle, and Upper. Suggests that there is no "Middle" series, as introduced by Murchison, but that the Caithness Flags, upon which that division was founded, might belong to the Lower Old Red Sandstone. R. B. N.

——. The Glacial Geology of Orkney and Shetland. *Nature*, vol. xvi. pp. 414–416.

Gives evidence of glaciation, roches moutonnées, boulder-clay, and valley moraines. There are no raised beaches in Orkney or Shetland. In the latter there are sheltered spots where such should be found; probably they never existed there, the elevation of the land having lessened towards the N. W. T.

Geikie, Dr. James. Letter to Mr. J. Gunn on the Glacial Beds of the East of England. [*Norwich Geol. Soc.*] *Norfolk Chronicle*, Feb. 17.

Thinks that the Cromer Till may be, in part, a *moraine profonde*, and in part such material assorted by aqueous agency; the Contorted Drift was formed on recession of the ice-sheet; and the large chalk-boulders were brought by ice-bergs. Some of the M. Glacial may be of freshwater origin, occupying the hollows which were eroded by river-action during some period of terrestrial conditions, that may have obtained after the disappearance of the Cromer Till ice-sheet or glaciers, and before the advent of that much greater ice-sheet to which the chalky boulder clay owes its origin. H. B. W.

——. The Antiquity of Man. *Nature*, vol. xvi. pp. 141, 142.

Reviews and restates arguments in favour of an interglacial age of the flint-implement-bearing gravels.

Gibson, G. A. The Old Red Sandstone of Shetland. A Graduation Thesis. Pp. 48. 8vo. *Edinburgh.*

Treats the subject from the following points of view:—Physiographical; Lithological; Petrological; Historical, including Stratigraphical Relations and Palæontological evidence; and Dynamical. A map and sections of the region are given. R. B. N.

——. On the Physical Geology and Geological Structure of Foula (W. of Shetland). *Rep. Brit. Assoc.* for 1876; *Sections*, p. 90.

The W. side of the island is composed of Old Red Sandstone at least 4400 feet thick, dipping S.S.W. This is faulted against gneiss and mica-schist, probably Laurentian, which form the E. side. W. T.

Glen, W. C. Remarks on the Wealden Borings. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 262–270.

Gives the section at the Sub-Wealden Exploration boring at Netherfield.

Godwin-Austen, R. A. C. On the Geological Significance of the Boring at Messrs. Meux's Brewery, London. (*Brit. Assoc.*) *Geol. Mag.* dec. ii. vol. iv. pp. 474, 475.

It confirms previous surmises as to the absence of Oolites under London; the thin sands under the Chalk resting on U. Devonian beds, which dip 30°, but in what direction is not known. London lies just on the edge of a trough of Coal Measures. W. T.

Graham, W. B. On the Geology of Sharnbrook. *Trans. Bedf. Nat. Hist. Soc.* for 1875–76, pp. 45, 46.

Describes the Cornbrash and Oxford Clay.

Green, Prof. A. H. On a Section of Boulder Clay, near Barnsley. *Proc. Geol. Soc. W. R. Yorksh.* n. ser. pt. iii. pp. 122–127, pl. vii. (section).

Describes a section in one of the patches of Drift on the plains on the E. side of the S. part of the Pennine range, in a railway-cutting 2 miles N. of Barnsley. This gives the following succession:—U. Boulder Clay; Warp, with sand and gravel, in the bed above; L. Boulder Clay; Grey Shale (Coal Measures); Woolley-Edge Rock. Notices the succession of events thus shown. W. W.

——. The Silkstone Seam of Coal at Worsborough. *Coll. Guard.* vol. xxxiii. p. 48. (From *The Times.*)

Corrects a misstatement respecting the sinking for coal of the Barrow Company at Worsborough.

Greenwell, G. C. On the Geological and other Features of the Great Northern Coalfield. *Journ. Iron Steel Inst.* pp. 463–470; and *Coal and Iron Trades Gazette,* No. 156, pp. 1002, 1003.

This coalfield is more or less basin-shaped, and covers an area under the North Sea as large, probably, as that which lies under Northumberland and Durham. Suggests the importance of having proper means of access to the sea coal. References to the literature are given in an appendix. R. B. N.

Greg, R. P. Boulders in the Neighbourhood of Buntingford, Herts. *Trans. Watford Nat. Hist. Soc.* vol. i. pt. 7, p. 172.

Notes the occurrence of Carboniferous and other boulders.

G[riffith], C. Geological List. *4th Rep. Winchester Coll. Nat. Hist. Soc.* pp. 86–90.

For the most part a reprint of the list of quarries and fossils in the 3rd Report. See GEOLOGICAL RECORD for 1875, p. 16.

Grimshaw, W. J. Pebbles from the Coal. *Trans. Manch. Geol. Soc.* vol. xiv. pp. 373, 374.

Pebbles found in the upper bed of the Three Yards coal at Radcliffe, like that found in Roger Mine of Dukinfield, the Black Mine of Oldham, the Trencher Bone Mine, Kearsley. C. E. R.

Grossart, W. Notes on a Tract of Vertical Trees in Carboniferous Strata. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 184–188.

Three vertical trees were found while cutting "horizontal mines in various directions from the pit bottom," in connexion with a coal-pit 40 fathoms deep sunk to the Little Drumgray Coal. The trees rest on the coal bed, and disappear in the shale forming the roof. They possessed "a central hollow and a distinctly separate wood and bark." R. B. N.

——. On River Débris found in Sandstone. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 188–192.

The beds above the Virtue Well coal are described in the following order (descending):—Sandstone, 60 feet; Gritstone, 2 feet; Shale, 18 inches; Laminated Sandstone, 10 feet; Black Shale. Concludes that the beds were formed at the mouth of a river flowing from E. to W. R. B. N.

Gunn, John. The Norfolk Forest Bed. *Geol. Mag.* dec. ii. vol. iv. pp. 335, 336.

Notes the authorities who have maintained that the trees of the Forest Bed are found on the spots where they grew, and gives evidence in support of this opinion. H. B. W.

——. The Forest Bed of East Norfolk. Letter to the *Norwich Mercury*, May 9.

——. Norwich Geological Society. Address of the Retiring President, and Proceedings of the Thirteenth Annual Meeting. 8vo. *Norwich*. Reprinted from the *Norwich Mercury*, Nov. 10.

Notes on prospects of coal in Norfolk, on the dip of the Chalk, on the Stony bed, Forest Bed, Chillesford Clay, Glacial beds, &c. Discussion on Forest Bed. H. B. W.

Gunn, William. Is there a Base to the Carboniferous Rocks in Teesdale? *Geol. Mag.* dec. ii. vol. iv. pp. 139, 140.

Answers that there is. See **Dakyns**, p. 8.

Hall, T M. Geology and Mineralogy of North Devon. In Stewart's 'North Devon Handbook.' Ed. 4. Pp. 279–289.

A summary of the various formations in the district, including the submerged forest and raised beaches of Barnstaple Bay, the Cretaceous and Triassic outliers near Bideford, the Carboniferous series, and the Devonian. The last is divided into 8 beds—those of the Foreland and Lynton being assigned to the Lower division; those of Martinhoe, Ilfracombe, and Morthoe to the Middle; and the Pickwell Down Sandstones, *Cucullæa* bed, and Pilton Slates to the Upper. Lists of the fossils characteristic of each bed are given, as well as an index to the minerals, with their localities. T. M. H.

——. The Geology and Mineralogy. In J. R. Chanter's 'Lundy Island, a monograph, descriptive and historical, with notices of its distinguishing features and Natural History.' Pp. 171. 8vo. *London.*

These notices, pp. 120–128, are taken from a paper in *Trans. Devon Assoc.* vol. iv. pp. 612–624 (1871).

Hardman, E. T. Explanatory Memoir to accompany Sheet 35 of the Maps of the Geological Survey of Ireland. On the Geology of the Tyrone Coal field and surrounding districts. With Palæontological Notes by **W. H. Baily**. Pp. 90. 11 woodcuts, plate of sections. *Geological Survey Memoir.* 8vo. *Dublin* and *London.*

Pt. i. *General description and list of papers on the district.* Formations: Recent and Post-Pliocene; Pliocene, Lough Neagh Clays; Miocene, basaltic rocks; Cretaceous; Triassic, Keuper and Bunter; Permian; Carboniferous, Coal Measures, Millstone Grit, Yoredale Beds, Limestones, &c. Pt. ii. *Palæontological notes,* Fossil localities, &c. Pt. iii. *Detailed description,* including 61 detailed sections of quarries, coal-mines, clay-pits, &c. The coal field contains 24 seams of coal, 10 of which, from 3 to 10 feet thick, are workable; also some thick beds of fine fire-clay, which are much used. The Pliocene Clays of Lough Neagh are very extensive, and in some places are employed for the manufacture of coarse pottery. Appendix I. *Analyses of Coals and Ironstones from Dungannon Coal-field*: Eight of the former are given, showing the coals to be of good quality, and it is noticed that the specific gravity progressively increases with the amount of ash; 6 of the latter are given, showing the average amount of iron. Appendix II. *Analysis of White Chalk, showing presence of Zinc.* Appendix III. *Fossiliferous Pliocene Clays overlying Basalt, Lough Neagh.* The junction is well seen; and this is the only locality where shells have been found in these clays or in British Pliocene lacustrine deposits. They appear to be a species of *Unio*; but the determination is not certain. E. T. H.

Hardman, E. T. On a Triple System of Post-Miocene Faults in the Basaltic Region around Lough Neagh. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. 4, pp. 239–241; woodcut.

In this district there are many Post-Miocene faults, and there appear to be at least three distinct sets, each having a distinctive bearing. Their general directions, in order of age, are:—1. N. 10° E.; 2. N. 45° E. to N. 65° E.; and 3. N. 30° W. to N. 50° W. Some of these faults are large, especially those belonging to No. 2, one having a throw of at least 2000 feet. The third and latest set is characterized by a small downthrow, being probably of a date when the volcanic disturbances were drawing to a close. The general bearing of this set coincides with the direction of a great number of the basaltic dykes in the N. of Ireland. It may be that the forces which gave rise to this set of faults helped to produce the fissures into which the intrusive basalt was admitted in the last settling-down of the basaltic crust. E. T. H.

Harkness, Prof. R., and Prof. H. A. Nicholson. On the Strata and their Fossil Contents between the Borrowdale Series of the North of England and the Coniston Flags. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 461–484; 3 woodcuts.

The Borrowdale series (Green Slates and Porphyries) are unfossiliferous, except a thin band near the top ("Style-End Grassing Beds") with fossils of Bala type. The beds above are, in ascending order:—1. *Dufton Shales*, locally distributed, best developed under the Cross-Fell Escarpment, where they are 300 feet thick, with Bala fossils, which often occur in ash beds; 2. *Coniston Limestone*, sometimes wholly shales, but interbedded felstones occur; the fossils are Bala; 3. *Graptolitic Mudstones* (Skelgill Beds) always overlie the Coniston Limestone, and likewise contain Bala fossils; probably lower part of Llandovery group, but clearly they are L. Silurian; 4. *Knock Beds*, always more or less cleaved, few fossils, probably = Tarannon Shales. Over these come the Coniston Flags, the equivalents of the Denbighshire Grits, and therefore U. Silurian. The series is conformable throughout. An *Appendix* describes "the Irish Representatives of the Coniston Limestone and its associated Rocks;" these occur at Lambay Island and Portraine, Co. Dublin, and at Grange Hill and the Chair of Kildare.
W. T.

Harmer, F. W. On the Kessingland Cliff-Section, and on the Relation of the Forest-Bed to the Chillesford Clay, with some Remarks on the so-called Terrestrial Surface at the base of the Norwich Crag. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 134–141; 3 woodcuts.

Reply to **J. Gunn** (see GEOLOGICAL RECORD for 1876, p. 14). The Kessingland Beds rest in a gorge cut out of, and consequently newer than, the Chillesford Clay. The stone bed at the base of the Norwich Crag is merely the basement-bed of the deposit which overlies it, and is not an old land surface. W. T.

Harmer, F. W. The "Testimony of the Rocks" in Norfolk. A Popular Description of the Geology of the County. Pp. 38; plate (section). 8vo. *London* and *Norwich.*

Describes the mode of formation of the Chalk, Norwich Crag, Forest Bed, and Glacial Beds, and illustrates their relation by a section from Hunstanton to Yarmouth, which also shows the beds below the Chalk. The Neocomian is called "Sandringham Beds." W. T.

Harris, H. K. The River Bourne, in Surrey. *Nat. Hist. Journ.* vol. i. no. 6, pp. 92, 93.

Describes this intermittent stream, and its geological cause.

Harrison, Jonathan. Notes on the Whitwick Collieries [Leicestershire]. *Proc. Dudley Geol. Soc.* vol. 3, no. 4, pp. 91, 92.

Describes a seam of intrusive, pre-Triassic dolerite, in the Coal Measures, and gives a list of coal-seams.

Harrison, W. J. On the Geology of Leicestershire. *Proc. Geol. Assoc.* vol. v. no. 3, pp. 126–136; 2 woodcuts (sections).

Describes the slate-rocks of Charnwood Forest, which are, perhaps, Laurentian, and the syenites, felstones, ashes, &c. of that area; also the Carboniferous Limestone, Coal Measures, Rhætic Beds, Lias, Oolites, and Post-Tertiary Beds. W. T.

——. Excursion to Leicestershire. *Proc. Geol. Assoc.* vol. v. no. 4, pp. 142–148.

Gives a detailed section of Market Harborough brickyard, which shows junction of M. and L. Lias. Describes Marlstone hills and Northampton Sand iron-ores; also Charnwood Forest and Mount Sorrel. W. T.

——. The Leicestershire Coal-field. *Proc. Dudley Geol. Soc.* vol. 3. no. 4, pp. 84–87.

Describes the structure, volcanic rocks, faults, &c. of the Nuneaton and Ashby Coal fields.

——. The Geology of Charnwood Forest. *Proc. Dudley Geol. Soc.* vol. 3, no. 4, pp. 88–91.

Describes the slate-rocks, syenite, Lias, the glacial striæ, and the Drift.

——. On the Rhætic Section at Dunhampstead Cutting, near Droitwich, and its Correlation with the same Strata elsewhere. *Proc. Dudley Geol. Soc.* vol. 3, no. 5, pp. 115–125; 2 plates (plan and section, fossils).

Glances at the literature of the British Rhætic Beds, giving the section at Penarth. Traces the series thence to Dunhampstead, where it is described in detail, with list of fossils. The plan and section are on a large scale. W. H. D.

Harrison, W. J. On the Occurrence of the Rhætic Beds in Leicestershire. *Trans. Cardiff Nat. Soc.* vol. viii. pp. 99–106.

Reprinted from the *Quart. Journ. Geol. Soc.* vol. xxxii. See GEOLOGICAL RECORD for 1876, p. 15.

——. A Sketch of the Geology of Leicestershire and Rutland. Reprinted from White's History &c. of the Counties. Pp. 67; 12 photographs. 8vo. *Sheffield.*

Leicestershire is described in much detail, pp. 1–58: Bibliography, pp. 5, 6; Crystalline and slaty rocks of Charnwood Forest, pp. 7–15; Carboniferous, pp. 15–28; Permian, pp. 28–30; Trias, pp. 30–34; Rhætic, pp. 34–36; Lias, pp. 36–42; Inf. Oolite, pp. 42, 43; Post-tertiary, pp. 43–47; Prehistoric Man, pp. 47–52; Mineral Springs, p. 52; Heights, p. 53; Mining Glossary, pp. 53, 54; List of Abortive Borings, p. 54; Coal-pit Sections, pp. 55–58. Rutland, pp. 59–67, is treated in the same way, the formations ranging from the Lias to the Cornbrash. W. H. D.

——. Outlines of the Geology of the Counties of England.—No. III. Northamptonshire, Huntingdonshire, Bedfordshire, Buckinghamshire, Oxfordshire, Berkshire. Pp. 28. 8vo.

Extracts from Post-Office Directories of articles describing the range, character, principal fossils, &c. of the Secondary, Tertiary, and Quaternary rocks of these counties. W. H. D.

——. A Sketch of the Geology of Hampshire. In White's History, Gazetteer, &c. of the County. Pp. 12. 8vo. *Sheffield.*

Describes the Cretaceous, Tertiary, and Post-tertiary series of Hampshire and the Isle of Wight, summarizing the literature, palæontology, &c. W. H. D.

——. Practical Geology. *Science and Art*, vol. i. pp. 58–60; *Student's Mag.* vol. i. pp. 9–11, 32–34, 59–61, 80–82, 103–106.

Part 1 describes the apparatus requisite in field-geology, the continuation describing the rocks and the leading fossils. Chap. iv., Practical Work among Cambrian Rocks, gives an account of the Murchison-Sedgwick controversy, describes slaty cleavage, stripe, Trilobites, &c. v. Practical Work among Silurian Rocks. vi. The Old Red Sandstone and Devonian Rocks. vii. The Carboniferous Formation. W. H. D.

Henderson, John. On the Wardie and Granton series of Sandstones and Shales. *Trans. Edinb. Geol. Soc.* vol. iii. pt. i. pp. 24–30; sketch map and sections.

Shows, in opposition to the Geological Survey, that the Granton Sandstones lie beneath the Wardie Shales. Granton is on an anticlinal, and Wardie and Redhall on the neighbouring synclinal. Regards the Burdiehouse series as not only different but unconformable to these. W. H. D.

Henslow, Prof. A Month at Felixstowe.—The Fossils of the Red Crag. *Proc. W. Lond. Sci. Assoc.* vol. i. pt. iv. pp. 118–120.
A list of the fossils, with notes on the London Clay and Crag.

Hepworth, J. Our First Spring Ramble. *Sci. Goss.* vol. xiii. no. 149, pp. 99–101.
Touches on the geology of the North Downs, near Chatham.

Hicks, H. On the Pre-Cambrian (Dimetian and Pebidian) Rocks of St. David's. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 229–241; pl. x. (Geol. Map and 4 sections), and woodcut.
The central ridge of the St. David's promontory, formerly supposed to be intrusive syenite and felstone, consists of altered sedimentary rock of two ages. The promontory ranges S.W. and N.E.; along its centre is a mass of schists, &c., dipping generally to the S.W., and having a thickness of at least 15,000 feet. These are the *Dimetian* Beds. Along the flanks of this ridge is another series (*Pebidian*) striking S.W. and N.E., and therefore unconformable. This has a conglomerate at its base, and is 3000 feet thick. Resting unconformably upon the Pebidian, and sometimes on the Dimetian, is the true Cambrian (Harlech group). The faults are described; two on Ramsay Island have throws of 14,000 feet, one bringing the highest Arenig beds against the lowest Cambrian. W. T.

Hill, Rev. E., and [Prof.] T. G. Bonney. The Precarboniferous Rocks of Charnwood Forest.—Part I. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 754–789; 6 woodcuts. (See also Letters in *Nature*, vol. xv. p. 470, vol. xvi. p. 8.)
The so-called "greenstone" and "felspathic porphyry" are altered rocks, volcanic breccias, ashes, or agglomerates. There is no passage between the slates and the syenite. The last is clearly intrusive, and the rocks in its neighbourhood are much disturbed. Probable correlations are given, the beds being classed as on four horizons. A statement that Bardon Hill is a plug of felstone is corrected; it is all altered rock. (See GEOLOGICAL RECORD for 1875, p. 4.) W. T.

Hillhouse, William. The Surface Geology and Physical Geography of Bedfordshire, with especial reference to a Botanical division of the County. *Trans. Bedf. Nat. Hist. Soc.* for 1875–76, pp. 83–91, map (not geol.).
Brief summary (one page) of the geological structure of the county.

Holgate, Benjamin. The Minerals of the Yorkshire Coal-field as applied to the Modern Manufacture of Iron. *Proc. Geol. Soc. W. R. Yorksh.* n. ser. pt. iii. pp. 137–148.
Under the heads—Fire-resisting Materials, Iron, Coals.

Hopkinson, John. Field Meetings. *Trans. Watford Nat. Hist. Soc.* vol. i. pt. 6, pp. xxxv, xxxvii, pt. 7, p. xli.

St. Albans, Hatfield Park, Boxmoor, Bennet's End, and Nash Mills. The geology noticed.

Howell, James. The Geology of Brighton.—Part II. *Proc. Geol. Assoc.* vol. v. no. 2, pp. 80–90. [For notice of Part I. see GEOLOGICAL RECORD for 1874, p. 18.]

Describes the "Temple Field Deposit." Temple Field, on the N. of Brighton, is now built over. The general section is:—1. Soil, with loam and seams of sand; 2. Clay or Brick-Earth; 3. Conglomerate and Ironstone, with flints, chalk, &c., and subsulphate and hydrate of alumina, gypsum, and selenite. This is the deposit described: it rests on chalk with flints. The conglomerate, &c. is regarded as the remains of Lower Tertiaries which once existed on this spot. Explanations of the formation of the minerals are given. W. T.

Howorth, Henry H. Geology of the Isle of Man. *Geol. Mag.* dec. ii. vol. iv. pp. 410–413, 456–459.

Maintains that the red conglomerate supposed to be Devonian is Glacial; it has been acted upon by volcanic action in Post-Glacial times. W. H. D.

Hughes, Prof. T. McK. On the Silurian Grits of Corwen, North Wales. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 207–212; 2 woodcuts.

Overlying the Bala Beds at Corwen are Grits and Conglomerates (Corwen Grits). These are separated from the Denbigh Flag series (which include the Denbigh Grits) by Pale Slates, part of which has hitherto been considered to be Bala. The true Bala Beds are doubly cleaved; those above them have only one cleavage. The Corwen Grits are taken as the base of the Silurian; and a like succession at the south end of the Vale of Clwyd is noted. W. T.

Hull, Prof. Edward. On the Upper Limit of the essentially Marine Beds of the Carboniferous Group of the British Isles and adjoining Continental Districts; with Suggestions for a fresh Classification of the Carboniferous Series. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 613–651; table of Fossils, 2 woodcuts; *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pp. 224, 225; and *Rep. Brit. Assoc.* for 1876, *Sections*, pp. 90, 91.

Reviews the established succession of Carboniferous rocks in various districts in the British Isles. Discards fish, reptiles, and plants as of partial value in classification: confining himself to the Mollusca, finds that the top of the Gannister Beds (or L. Coal Measures) forms a natural division of the Carboniferous series. All beds above that are essentially freshwater or estuarine (except local marine bands in Scotland

and Staffordshire); these beds are *U. Carboniferous*. The *M. Carboniferous* includes all from the top of the Gannister Beds to the base of the Yoredale Series; these are essentially marine. The *L. Carboniferous* includes the Carboniferous Limestone proper and all below it. This division is also essentially marine; but near the base it is sometimes lacustrine. The Gannister Series of the British Islands contains 36 genera and 70 species of marine forms; 18 of these species are peculiar to this series, about 40 come up from the Carboniferous Limestone, and only 6 pass up into the U. Carboniferous. W. T.

Hull, Prof. E. Premature Conclusions. *Geol. Mag.* dec. ii. vol. iv. pp. 378–380.

Reply to Mr. Dakyns's criticisms (see p. 8).

——. On a Deep Boring for Coal at Scarle, Lincolnshire; and its Bearing on the Question of the Easterly Limit of the Yorkshire Coal Measures beneath the Newer Formations. *Proc. Inst. Civ. Eng.* vol. xlix. p. 160, pl. 4 (geological map); *Rep. Brit. Assoc.* for 1876, *Sections*, pp. 91, 92; and *London Iron Trades Exchange*, vol. xxi. p. 136. [See also GEOLOGICAL RECORD for 1876, p. 19.]

The beds passed through are grouped as follows:—Drift 10 ft.; L. Lias 65; Rhætic 66; New Red 1359; Permian 400; Carboniferous 130. The lowest beds may be Yoredale or U. Coal Measures. W. T.

Hunter, James. The Silurian Rocks of Furness and Cumberland. *Trans. Barrow Nat. Club*, vol. i. pp. 104, 105.

Hutchinson, Rev. T. N. Geology of Charnwood Forest. *Rep. Rugby School Nat. Hist. Soc.* for 1876, pp. 34–41, pls. i.–iii. (map and rock-sections).

General sketch of the geology, with details and figures of the microscopic structure of several igneous rocks.

Irving, Rev. A. On the so-called "Permian" and the New Red Sandstone Formations. *Geol. Mag.* dec. ii. vol. iv. pp. 309–312.

There is no evidence of important unconformity between these formations in Nottinghamshire.

Jackson, Canon. The Vale of Warminster. (Archæological Society.) *Devizes and Wiltshire Gazette*, vol. lxii. nos. 3114, 3115.

Touches on the geology of the valley.

Jackson, Rev. W. Visitor's Handbook to Weston-super-Mare and its Vicinity. Edited by **L. E. H. J.**, under the superintendence of the **Rev. W. Jackson.** *Weston-super-Mare* and *London.*

Notes on geology.

Johnson, H. Sandwell Sinkings [Bromwich]. *Proc. Dudley Geol. Soc.* vol. 3, no. 4, pp. 97–99.

Describes the measures passed through—Trias?, Permian?, and Coal Measures.

Jordan, H. K. On Coal-Pebbles and their Derivation. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 932–934.

Refers chiefly to S. Wales. Supposes that the coal-pebbles were derived from the erosion of coal-seams near where they are found: they only occur where Sandstone forms the roof of the seam. W. T.

Judd, Prof. J. W. Deep Well-Borings in London. *Nature*, vol. xvi. pp. 2, 3.

Notes wells and borings, especially at Kentish Town, Crossness, Meux's Brewery, and Loughton, which prove the Chalk under London to be from 645 to 653 feet. W. T.

Jukes-Browne, A. J. Notes on the Correlation of the Beds constituting the Upper Greensand and Chloritic Marl. *Geol. Mag.* dec. ii. vol. iv. pp. 350–364.

Reviews the definitions of these horizons up to 1875. Advocates the disuse of the name Chloritic Marl, replacing it by that of *Scaphites æqualis* zone, and restricts the term Upper Greensand to the Warminster Beds (*Pecten asper* and *Exogyra conica*), giving the results in a table of 7 localities. W. H. D.

Kinahan, G. H. On the Chesil Beach, Dorsetshire, and Cahore Shingle Beach, County Wexford. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 29–41, pl. ii. and woodcut; and *Land and Water*, vol. xxiii. p. 385.

Gives an account of the tides in the English Channel and Irish Sea; the driftage of sea-beaches is chiefly due to the flow-tide; compares the Chesil Beach with that at Cahore; and concludes that they are due to nearly the same causes, but that at Chesil the driftage is due to the flow-tide current augmented by wind-waves, while at Cahore it is due to the flow-tide currents alone, its effect being modified by adverse wind-waves. The sorting of the pebbles on Chesil Beach is caused chiefly by the increase in the velocity of the tidal current as it approaches the nodal line of the tide in the English Channel. W. T.

——. Irish Drift. Subgroups: Aqueous and Glacial Drifts. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. 4, pp. 210–218; *Trans. Manch. Geol. Soc.* vol. xiv. pp. 190–205; and *Land and Water*, Jan. 19, 1878.

Aqueous Drift.—Drift sorted and deposited by water sometimes contains ice-derived fragments, and often appears to pass into Glacial or meteoric Drift. Some of these Drifts may belong to the Glacial period, or may be even pre-Glacial, or may be of later age, and in some places are often caused by glacialoid Drift derived from neighbouring cliffs of older Drift. The typical Glacial Drift occurs in unstratified masses. In Ireland there are two varieties—the older "Boulder Clay drift," the newer Boulder Clay or "Moraine drift." Considers the presence of "Middle gravels" in Ireland not proven. E. T. H.

Kinahan, G. H. Hummocky Moraine Drift. *Nature*, vol. xv. p. 379; woodcut.

Gives a sketch of drift-hummocks on the N. slope of Croagh-na-Cloosh, S. of Oughterard, Ireland.

——. Hog-Wallows and Prairie Mounds. *Nature*, vol. xvi. p. 7.

The hummocks noted above are different in origin from the Hog-Wallows.

[——.] (**Nahanik.**) The Murrogh of Wicklow. *Land and Water*, vol. xxiii. p. 45.

Gives a description of the growth of the murrogh (*sea-plain*) of Wicklow, and shows that its formation is due to the action of the flow tide-waves, assisted by wind-waves from the N. and N.E. G. H. K.

Laing, S. Glacial Geology of Orkney and Shetland. *Nature*, vol. xvi. pp. 418, 419; vol. xvii. p. 123.

Thinks there is no good evidence of glaciation or of raised beaches in these islands.

Lankester, [Prof.] E. R. The Crag Fossils in the Ipswich Museum. *Suffolk Chronicle*, Aug. 4. Reprinted by **E. Charlesworth,** with remarks on the prospective exhaustion of the phosphatic crag stratum.

Remarks on the excellent collection of fossils.

Lasaulx, Dr. Arnold von. Aus Irland. Reiseskizzen und Studien. [Ireland. Notes of Travel.] Pp. viii, 240; map, view, woodcuts. 8vo. *Bonn.* [Dated 1877 on title, 1878 on cover.]

Contains geological and minerological notes on Killarney, Wicklow, and the Giant's Causeway. Also notes on Glasgow and its neighbourhood, and on the I. of Arran. F. W. R.

——. [Geology at S. Kensington.] *N. Jahrb.* Heft ii. pp. 170–174; woodcut.

Notes on the geological department in the Loan Collection of Scientific Apparatus at S. Kensington. Explains the maps of the Geological Survey, and describes the Sub-Wealden boring, of which a section is given. F. W. R.

Lebour, G. A. On the Terms "Bernician" and "Tuedian." *Geol. Mag.* dec. ii. vol. iv. pp. 19, 23.

Discusses the advantages to be gained by the use of these terms as indicating different conditions of deposit of the Carboniferous Limestone Series of Northumberland (see Geological Record for 1876, p. 22). The term "Bernician" was proposed by Dr. S. P. Woodward in 1856, and was adopted by Karl Meyer in 1874; these authors, however, included under it all beds between the Millstone Grit and the Devonian. W. T.

Lebour, G. A. On the Changes affecting the Southern Extension of the Lowest Carboniferous Rocks. *Rep. Brit. Assoc.* for 1876, *Sections*, p. 93.

The upper limit of the Tuedian or Calciferous Sandstone runs in a kind of lateral dovetailing into the lower beds of the Bernician or Carboniferous Limestone. W. T.

Lebour, G. A., and **Mark Fryar.** On the Harkess Rocks, near Bamburgh. *Trans. N. Engl. Inst. Eng.* vol. xxvi. pp. 121–129, pls. xviii., xix. (geol. map and sections), and 7 woodcuts.

Describes the Whin Sill as seen on the shore N.W. of Bamburgh. The Whin has been intruded laterally amongst the shales, sandstone, and limestone of the Carboniferous Limestone (Bernician) series; but it frequently breaks through the beds. The normal condition in this district is to have a shale floor and a limestone roof. W. T.

Lee, J. E. Notice of the Discovery of Upper Devonian Fossils in the Shales of Torbay. *Geol. Mag.* dec. ii. vol. iv. pp. 100–102, pl. v.

Gives a list: no new species.

Lobley, J. L. Excursion to Caterham, Godstone, Tilburstow, and Nutfield [Surrey]. *Proc. Geol. Assoc.* vol. v. no. 5, pp. 155–159.

Describes the Chalk, Firestone, and L. Greensand of the district. Quotes a letter by **J. B. Latham** on the Croydon Bourne (*Croydon Chronicle*, Jan. 25); and gives a list of fossils from Nutfield, by **C. J. A. Meyer.** W. T.

——. The Eocenes of England and their Extension in Hertfordshire. *Trans. Watford Nat. Hist. Soc.* vol. i. pt. 7, pp. 161–171.

General description, with remarks on the local range of the Woolwich Beds and London Clay, and abstracts of well-sections. W. H. D.

Lucas, Joseph. The Artesian System of the Thames Basin. *Journ. Soc. Arts*, vol. xxv. no. 1277, pp. 597–619 (map and sections). See also **S. C. Homersham,** no. 1278, p. 657.

Divides the district into the following basins:—Ravensbourne, Wandle, Beverley, Hog's Mill River, Abrook, or Rythe, Mole (in part). Notes of the wells in each are given; and full details are printed in Appendix. An experimental boring to tap the Lower Greensand should be as far to the south-west as possible; for in that direction the beds are thick and sandy. The best position is at Tooting Graveney. **Mr. Homersham** gives a correction of the discussion, and analyses of well-waters by **Mr. D. Campbell.** W. T.

McClay, J. L. Some Notes of the Geology of Londonderry, made during Holiday Rambles in that County. *Proc. Liverpool Geol. Soc.* vol. iii. pt. 3, pp. 236–241.

Connects the upheaval of the Basin of the Foyle and the counties of Derry and Antrim with the depression of the Irish Channel. Considers W. and N.W. Ireland to be gradually sinking. C. E. R.

Macdakin, Capt. The Northampton Ironstone Beds in Lincolnshire. *Geol. Mag.* dec. ii. vol. iv. pp. 406–410; woodcuts (sections and map).

Describes the beds, 8 feet thick, which occur below the Lincolnshire Limestone and a little above the Lias. The upper beds are siliceous, the lower argillaceous. The ore is a blue carbonate, which weathers brown near the outcrop. W. T.

Mackintosh, David. On a Number of New Sections around the Estuary of the Dee which exhibit Phenomena having an important bearing on the Origin of Boulder-clay and the Sequence of Glacial Events. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 730–739; 3 woodcuts.

Three divisions are well marked:—upper and lower clays, divided by middle sands. The sands are not always present; but the line between the clays is clear in good sections. Occasionally there are deposits of stones and sand at the base of the lower clay; and there are also layers of sand, &c. near its top. The two clays have probably a threefold origin:—local grit and sand furnished by ordinary sea-action, clay washed out from beneath the ice-sheet or glacier of the Lake District and distributed by currents, and stones supplied by floating coast-ice. Describes the striated rock-surfaces and erratic blocks; also the general range, vertical and horizontal, of the two clays and the sand. W. T.

——. Mr. Durham on Kames and Mr. Mellard Reade on Boulder Clay. *Geol. Mag.* dec. ii. vol. iv. pp. 94, 95.

The Kames of North Wales have been scarcely modified by atmospheric action. The Drift is not completely representative near Liverpool. W. T.

——. Tripartite origin of the Boulder-clays of the North-west of England. *Geol. Mag.* dec. ii. vol. iv. pp. 575, 576.

A restatement of the conclusion in the first paper.

Madeley, William. The Breidden Hills. *Proc. Dudley Geol. Soc.* vol. 3, no. 3, pp. 50–53; map and sections.

The rocks are Llandeilo ash-beds with intrusive greenstone.

Mahony, J. A. On the Natural History of Donegal, with some account of its Archæology. *Proc. Nat. Hist. Soc. Glasgow*, vol. iii. part ii. pp. 152–162.

Touches on the minerals and Post-tertiary deposits.

Mansell-Pleydell, J. C. An Address. *Proc. Dorset Field Club*, [vol. i.] pp. 1–14.

Alludes to the Subwealden boring, the water-supply in the Chalk, and the results of the 'Challenger' Expedition.

Marten, E. B. The Rowley Hills. *Proc. Dudley Geol. Soc.* vol. 3, no. 3, pp. 56, 57.
Describes the basalt capping the Coal Measures.

——. The Geology of Stourbridge. *Proc. Dudley Geol. Soc.* vol. 3, no. 4, pp. 70–72; map and sections.
Describes Silurian, Carboniferous, Permian, and Triassic rocks.

Martin, R. F. Notes on some Peculiarities of the West Cumberland Coal Field. *Trans. Cumb. Assoc.* part ii. pp. 63–66.
Gives facts relating to faults.

Mello, Rev. J. M. The Bone-Caves of Cresswell Crag.—3rd Paper. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 579–588; 16 woodcuts on plate. [For notices of preceding papers see GEOLOGICAL RECORD for 1875, pp. 30, 273; for 1876, pp. 10, 25.]
Describes further researches in Robin Hood Cave and the exploration of the Church Hole. The beds are, in ascending order:—sand; earth and fragments of limestone ("mottled bed"), occurring only near the mouths of the caves; cave-earth; breccia; stalagmite. The implements of the sand are of quartzite, roughly made; those of the breccia are of flint, and more finished; both kinds occur in the cave-earth, the rougher forms chiefly in the lower part. In the cave-earth of Robin Hood Cave have been found a tooth of *Machairodus latidens*, and a bone showing the sketch of a horse. W. T.

——. Excursion to Derbyshire. *Proc. Geol. Assoc.* vol. v. no. 4, pp. 186–190.
Describes Clay Cross Collieries, the Carboniferous Limestone, Millstone Grit, caves, and fissures of the districts visited.

——. Caves and their Occupants. Illustrated by the Bone-Caves of Cresswell Crags. *Pop. Sci. Rev.* n. s. vol. i. pp. 369–389; 13 woodcuts.
A general description of caves, and of the inferences drawn from their exploration. The caves of Cresswell Crags are fully described.

Meyer, C. J. A. Excursion to Guildford. *Proc. Geol. Assoc.* vol. v. no. 4, pp. 161–163.
Describes the Chalk, L. Greensand, and the gravels of Peasemarsh.

Milne-Home, Dr. D. Abstract of Additional Memoir on the Parallel Roads of Lochaber. *Proc. R. Soc. Edinb.* vol. ix. pp. 299–302; and *Rep. Brit. Assoc.* for 1876, *Sections*, pp. 93, 94. [For notice of former paper see GEOLOGICAL RECORD for 1876, p. 26.]

A reply to a lecture by **Dr. Tyndall** (see GEOLOGICAL RECORD for 1876, p. 37). Maintains that the detrital theory of lake-barriers is correct, and gives additional facts in support of his views. The agency of the sea is called in, in addition to that of the rivers discharging from the lakes, to account for the breaking down of the barriers of detrital matter. The traces of glacial action in various parts of Lochaber belong to a period long antecedent to the lakes of Glen Roy and Glen Spean. R. E., Jun.

Milne-Home, Dr. D. On High-Level Terraces in Carron Valley, County of Linlithgow. *Rep. Brit. Assoc.* for 1876, *Sections*, p. 94.

The highest are 140–150 feet above the sea, sloping seawards to 50–60 feet, and are probably marine. The lower terraces occur only along the rivers, 29–35 feet above their present channels. An old sea-beach occurs at about the same height along the coast of the Frith of Forth. W. T.

——. Are there no Boulders in Orkney and Shetland? *Nature*, vol. xvi. p. 476.

Gives instances of boulders in these islands. These and the striations are due to floating ice.

Molyneux, W. Red or Keuper Marls near Burton [-on-Trent]. *Proc. Dudley Geol. Soc.* vol. 3, no. 4, pp. 102, 103.

Describes a gypsum quarry in the marls.

——. The Bunter Conglomerates of Cannock Chase. *Proc. Dudley Geol. Soc.* vol. 3, no. 5, pp. 139–149.

Describes the conglomerate, giving lists of fossils (from May Hill Sandstone and Mountain Limestone) found in the pebbles.

Moore, Charles. The Liassic and other Secondary Deposits of the Southerndown Series [Glamorganshire]. *Trans. Cardiff Nat. Soc.* vol. viii. pp. 53–60.

Gives a sketch of the structure of the Mendip Hills, and points out the peculiar characters of the secondary deposits connected with them. Considers the rocks of the Southerndown Series to represent similar abnormal conditions of the Lias. The stone at Sutton (S. Wales) is identical with that at Shepton Mallet. Gives notes of the fossils and minerals. [In the main a repetition of facts and views published in *Quart. Journ. Geol. Soc.* vol. xxiii. p. 449, 1867.] H. B. W.

Morris, Rev. F. O. Sea *versus* Land on the East Coast of Yorkshire. *Leisure Hour*, no. 1340, pp. 620, 623.

A description of the coast changes and loss of land between Flamborough Head and Spurn Point.

Morris, Prof. John. Lecture on the Geology of Croydon. *6th Report Croydon Micr. Club.* [Reprint of paper noticed in the GEOLOGICAL RECORD for 1875, p. 30.]

Morton, G. H. The Glacial Striæ of the Country around Liverpool. *Proc. Liverpool Geol. Soc.* vol. iii. pt. 3, pp. 284–291.

Striæ were first found by the author in 1859. The locality and direction of striæ found by subsequent observers are noted, the larger number showing a remarkable parallelism. C. E. R.

——. On the Graptolites found in the Lower Llandeilo strata, near the Church, Shelve, Shropshire. *Proc. Liverpool Geol. Soc.* vol. iii. pt. 3, pp. 296–298.

These beds have been referred by Mr. Hopkinson to the L. Arenig. The author, as in his paper of 1869, considers them to belong to the top of the Arenig or L. Llandeilo. C. E. R.

——. The Carboniferous Limestone and Millstone Grit of Llangollen. *Proc. Liverpool Geol. Soc.* vol. iii. pt. 3, pp. 299–325.

Gives a list of 76 species of fossils collected by himself during 7 years' visit to Llangollen: 61 species occur in the upper grey limestone; only 16 occur in the lower brown limestone, and 4 are peculiar to it. Grouping the four beds into an upper and a lower division, 37 species are peculiar to the former, 14 to the latter, and 25 are common to both. The outlier of Carboniferous Limestone at Hafod-y-Calch, near Corwen, is described and the fossils listed; the thickness is probably 750 feet, and the lower beds are possibly absent. The fossils belong to the horizon of the upper grey limestones. Sections at Fron-y-Cysllte, Bron-y-Garth, near Chirk, and Craignant, are described, all belonging to high beds, the Silurian having probably here formed land during the deposition of the lower beds to the N. and E. C. E. R.

Murchison, the late Sir R. I. A Chapter on the Geology of the District in the Rev. H. D. Gordon's 'History of Harting' [Sussex]. *London.*

Neilson, James, Jun. Geological Notes on the Cuttings in the City of Glasgow Union Railway between Bellgrove and Springburn. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 222–234.

The sections described are in Drift (sand and Boulder clay) and Carboniferous beds with trap. The fossiliferous beds are noted, and a list of fossils given. W. W.

——. On the Armagh Limestones, and their equivalents in Scotch Strata. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 314, 315.

The Armagh Limestones belong to the lower division of the Carboniferous slates, and correspond with those found in Scotland at Campsie, Kilbride, Carluke, Lesmahagow, Muirkirk, and Beith, and at several places on the E. coast. Of 21 species of fish from the Armagh Limestone, 14 are found in Scotland. R. B. N.

Nolan, J. Explanatory Memoir to accompany Sheet 70 of the Maps of the Geological Survey of Ireland. With Palæontological Notes by **W. H. Baily.** Pp. 34. 10 woodcuts. 8vo. *Dublin* and *London.*

The area described includes parts of Armagh, Monaghan, and Louth, and the towns of Dundalk and Carrickmacross. Pts. 1–3. *General Description* and *Formations*: L. Silurian; L. Carboniferous sandstone, Limestone, and Coal Measures; Triassic; Granite; Basalt and Dolerite; Diorite; Mica-trap; Felstone and Felspar-porphyry; "Volcanic Agglomerate," a curious result of the protrusion of the felspar-porphyry (see below); Elvanite; 2 analyses of igneous Rocks, by **Rev. Prof. Haughton**, are quoted. Pt. 4. Palæontological Remarks. Pt. 5. Notes on Microscopic Structure of the Dundalk Rocks by **Prof. Hull**. Pt. 6. Detailed descriptions, divided for convenience into districts. Pt. 7. Drift Deposits, &c. Pt. 8. Mines and Mineral Localities. E. T. H.

Nolan, J. On a remarkable Volcanic Agglomerate near Dundalk. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. 4, pp. 233–239; plate.

The district referred to is the hill-country N. of Dundalk, having Slieve Gullion as its centre. This is formed of massive igneous rocks; but around it are low hills composed of quartziferous felstone-porphyry, on the tops and slopes of which is the agglomerate. The upper part of the rock has the appearance of a slate-breccia; but as the deeper parts are examined, fragments of granite, diorite, and the felstone-porphyry of the district are found, the last ultimately forming the base. There is an intimate connexion between the agglomerate and the felstone-poryhyry; and in one place there is such a passage that it is impossible to find any line of demarcation. In one place the agglomerate consists of pieces of granite, sometimes large, in a base of fine granite-dust. This agglomerate is due to the aëriform explosions which accompanied the intrusion of the felstone-porphyry. Notices in detail the igneous rocks of the district, and remarks on the presence of tridymite in the porphyry, a mineral already observed by Von Lasaulx in the Tardree rhyolite (see *post* under MINERALOGY). The igneous rocks are chiefly Post-Carboniferous. E. T. H.

Norton, H. The Forest Bed of East Norfolk. *Norwich Geol. Soc.* Reprinted from *Norwich Mercury*, May 5. Pp. 12. See Notice in *Geol. Mag.* dec. ii. vol. iv. p. 320.

Notes on a visit to Mundesley, and a review of opinions regarding the Forest Bed. The so-called stools of trees have but a false appearance of having grown where found, and might naturally have been drifted into their positions. The evidence for the Forest-bed is unsatisfactory, one writer quoting from another, and none giving any precise observations. H. B. W.

Oliver, J. W. Geology of Ban Beacon. *Proc. Dudley Geol. Soc.* vol. 3, no. 4, p. 100.

Describes the Permian and Trias. U. Silurian and Carboniferous Rocks are near.

Oliver, J. W. Railway Cutting at Daw End, near Walsall. *Proc. Dudley Geol. Soc.* vol. 3, no. 5, pp. 111, 112; plate (plans and sections).

Describes a cutting in Coal Measures, Wenlock Limestone and Shale, giving a list of fossils from the last, and noting an apparent division, probably only due to discoloration. The plan and section are on a large scale. · W. H. D.

Peacock, W. D. Dudley Port Limestone Pits. *Proc. Dudley Geol. Soc.* vol. 3, no. 4, p. 93.

Describes the Wenlock Limestone worked below Wenlock Shale and Coal Measures.

Pearce, Horace. Notes on the Pebbles of Whittington Common. *Proc. Dudley Geol. Soc.* vol. 3, no. 4, pp. 74, 75: map.

Shows by a map the sources of the pebbles—Scandinavia, Scotland, and Wales.

——. Notes on the Geology of the Wrekin and surrounding District. *Proc. Dudley Geol. Soc.* vol. 3, no. 4, pp. 93–96.

Sketch of the geology—Igneous, Silurian, Carboniferous, and Triassic Rocks.

Pengelly, William. Notes on Boulders and Scratched Stones in South Devon.—Part II. *Trans. Devon Assoc.* vol. ix. pp. 177–183.

Notices small boulders of trap at Druid, about half a mile N.W. of Ashburton, at from 230 to 300 feet above the sea; and a large group at East Leigh, Harberton. These are of a red siliceous stone, and occupy an area ¾ mile by ½ mile. One of the largest blocks measures 17 × 10 × 5 ft., and rests upon soft shillet. The boulders are found close to the pile of rock marked in the Ordnance Map as Berry stone rock, and appear to have been derived from it. T. M. H.

——. Notes on Recent Notices of the Geology and Palæontology of Devonshire.—Part IV. *Trans. Devon. Assoc.* vol. ix. pp. 409–448.

Remarks and criticisms on Mr. Worth's paper on the Geology of Plymouth (1876): A. W. Buckland on the Geology of South-east Devon (1876); Prof. W. C. Williamson on Kent's Cavern; and Rev. J. M. Mello on *Machairodus latidens* (see p. 28). T. M. H.

——. Twelfth Report of the Committee for exploring Kent's Cavern, Devonshire. *Rep. Brit. Assoc.* for 1876, pp. 1–8.

The Great Oven: in this passage the crystalline stalagmite is often absent, the cave-earth and the old breccia coming together; beneath the last the limestone-floor of the cavern was reached continuously for 24 feet. 2 flakes were found in the cave-earth. *The Labyrinth*: here, also, the floor of crystalline stalagmite is absent, and probably never existed; but bosses of stalagmite, often crystalline, are bedded in the breccia. This division of the cavern had been partly explored by MacEnery. *Matthew's Passage*: a large number of bears' teeth occurred in the breccia.

Neither this nor the Labyrinth yielded traces of prehistoric man. Remains of ox, horse, rhinoceros, deer?, fox, elephant, and lion have now been found further from the entrance of the cavern than before. W. T.

Pengelly, William. Antiquity of the Cave Men. (Glasgow Science Lecture.) Pp. 27; 2 woodcuts. 8vo. *London and Glasgow.*

A sequel to the lecture noticed in the GEOLOGICAL RECORD for 1876, p. 29. Adduces geological, biological, archæological, geographical, and climatological evidence on the subject, with special reference to Kent's Cavern. W. H. D.

——. History of Cavern Exploration in Devonshire, England. *Amer. Journ.* ser. 3, vol. xiv. pp. 299–308, 387–393.

Address to the Geological Section of the British Association (1877) *minus* the opening paragraphs. Will be noticed in the GEOLOGICAL RECORD for 1878. W. H. D.

Pennington, Rooke. Notes on the Barrows and Bone-Caves of Derbyshire. With an account of a Descent into Elden Hole. 8vo. *London.*

Pile, L. L. The Isle of Wight. *Trans. Clifton Coll. Sci. Soc.* vol. ii. pt. ii. pp. 57–62.

A general description, chiefly geological. Notices the finding of elephant-remains in gravel at Freshwater.

Plant, James. The Rocks of Charnwood Forest. *Nature*, vol. xv. p. 548.

The intrusive character of the syenite S.E. of Bardon Hill has long been known.

Postlethwaite, John. Mines and Mining in the Lake District. Map, section, and plans. *Leeds.*

Describes the geological structure and mineral veins (lead, copper, graphite, &c.).

Price, F. G. H. On the Beds between the Gault and Upper Chalk near Folkestone. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 431–448.

The beds described are, in ascending order:—*Chalk Marl*, 24 feet; i. the lower 14 feet, zone of *Stauronema Carteri*, is the so-called U. Greensand, but it contains no true U. Greensand fossils; ii. zone of *Plocoscyphia mæandrina*, 10 feet. *Grey Chalk*, 174 feet; iii. 8½ feet, equals lower part of Barrois' zone of *Ammonites varians*; iv. 11 feet, equals upper part of zone of *Am. varians*; v. "cast bed," 2 ft. 9 in., the water at Lydden Spout is thrown out by this bed; beds iii., iv., and v. together form the zone of *Am. Rhotomagensis*; vi., 148 feet, zone of *Holaster subglobosus*; vii., 4 feet, zone of *Belemnites plenus*. *Lower Chalk* with *Inoceramus labiatus*, 150 feet; viii., 32 feet, zone of *Cardiaster pygmæus*; ix., 118 ft., zone of *Echinoconus subrotundus* and *Terebratulina gracilis*. Above this comes the Upper Chalk. W. T.

Prior, Dr. C. E. Cornish Notes, Botanical and Geological. *Trans. Bedf. Nat. Hist. Soc.* for 1875–76, pp. 62-64.

Describes the Cornish granite and the mines of tin and copper.

Ramsay, Prof. A. C. The Existence of Coal beneath the New Red and Permian Strata. *Proc. Dudley Geol. Soc.* vol. 3. no. 3, pp. 35–37; plate (map and sections).

Describes the mode of formation of coal and the structure of the Midland coal-fields.

Randall, J. The Geology of Linley Brook and the neighbourhood. *Proc. Dudley Geol. Soc.* vol. 3. no. 3, pp. 38–45.

Describes the series (Permian, Carboniferous, Old Red Sandstone, and U. Ludlow), and sketches the history of their deposition.

Randall, —. Geology of Shropshire and South Staffordshire. *Coll. Guard.* vol. xxxiv. p. 347.

Remarks on the Pennystone ironstone seam.

Reade, T. M. Glacial Striations at Little Crosby. *Proc. Liverpool Geol. Soc.* vol. iii. pp. 241-3.

The striæ occur on L. Keuper Sandstone, at a quarry N. of the village, and range N. 22° W. Others occur opposite Great Crosby Police Station, and range N. 40° W. C. E. R.

——. The threefold Division of the Boulder clay of the North-west of England. *Geol. Mag.* dec. ii. vol. iv. pp. 38, 39.

Considers the differences seen in the section at Liverpool not to be of the nature of geological subdivisions.

Reed, W. An Artesian Well at Masham in the North Riding. *Ann. Rep. Yorksh. Phil. Soc.* for 1876, pp. 29–35.

Mentions several noted borings, giving particulars of some, and of a recent one at Masham, 435 feet in Millstone Grit. Water rises to 35 feet above the surface. W. H. D.

Reid, Clement. Modern Denudation in Norfolk. *Geol. Mag.* dec. ii. vol. iv. pp. 136, 137.

Gives instances of the loss of land resulting from a high tide and W.N.W. wind. From Hasborough to beyond Sherringham the average loss was about a yard. W. T.

——. On the Succession and Classification of the Beds between the Chalk and the Lower Boulder-clay in the neighbourhood of Cromer. *Geol. Mag.* dec. ii. vol. iv. pp. 300–305.

Describes:—1. Weybourne Beds and Forest Bed (marine); 2. Freshwater Bed; and 3. *Leda myalis* Bed (marine), giving lists of fossils and section. W. H. D.

——. On the Junction of the Limestone and Culm-measures near Chudleigh. (Brit. Assoc.) *Geol. Mag.* dec. ii. vol. iv. pp. 454, 455.

Thinks there is a passage between these formations, faults producing apparent unconformity.

Ricardo, H. G. The Channel Subway. *4th Rep. Winchester Coll. Nat. Hist. Soc.* pp. 26–30.
Notices the geological conditions.

Richardson, C. E. Severn Tunnel. The Rocks at Portskewet. *Trans. Cardiff Nat. Soc.* vol. viii. pp. 65–76; folding section.
Notes on the action of tides and currents on the materials brought down and distributed over the bed of the Severn; with remarks on the form and origin of the river-channel. Gives a plan of the Severn Tunnel Works, with details of the strata penetrated in the shaft at Sudbrook and in the tunnel; these included New Red Sandstone and Conglomerate, Coal Measures, Millstone Grit, and Carboniferous Limestone. Notes the occurrence of large springs of water in the Pennant rock beneath the Severn, which was salt, though not so salt as the Severn water. H. B. W.

Richardson, Ralph. Notice of Glaciated Rock Surfaces (displaying Corals) near Bathgate recently quarried away. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 108, 109.
A striated face of Carboniferous Limestone under Boulder Clay in Petershill Quarry.

——. Note on a Striated Erratic recently exposed at Granton, with Observations on the Requisites for Determining the Parent Rocks of Erratics. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 109–111.
A greenstone boulder, weighing several tons.

Ricketts, Dr. Charles. The Conditions Existing during the Glacial Period; with an Account of the Glacial Deposits in the Valley between Tranmere and Oxton. *Proc. Liverpool Geol. Soc.* vol. iii. pp. 245–272.
Considers the Glacial striæ around the mouth of the Mersey as due to a local glacier, reaching a thickness in mid-channel of 225 feet. The sandy material occurring on the rock-surfaces beneath the Boulder Clay is regarded as moraine material; and examples are cited in the Happy Valley. Shells of Mollusca occurring in irregularly stratified sands did not belong to animals living on the spot. These deposits and the Boulder Clays were formed in bays protected from wind-waves by dense pack-ice. C. E. R.

Robertson, D. Notes on a Raised Beach at Cumbrae. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 192–200.
A list is given of the 113 species occurring in this raised beach.

——. Notes on a Post-Tertiary Deposit of Shell-bearing Clay on the West side of the Railway Tunnel at Arkleston, near Paisley. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 281–287.

The shells are marine, and belong to shallow as well as to deeper water, though the prevailing ones are littoral. A list of the fossils found is given. R. B. N.

Robertson, D. Garnock Water Post-Tertiary Deposit. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 292–296.

This deposit is exposed on the S. bank of the Garnock, the bank being about 22 feet above the sea-level. It is similar to the Dalmuir beds, which are at about the same level; and both contain remains of *Echini*. A list of 106 species obtained is given. R. B. N.

——. Notes on the Post-Tertiary Deposit of Misk Pit, near Kilwinning. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 297–309.

Mentions the beds passed through. Remarks are made on Chalk flints in Laminated Clay, Flints in Boulder Clay, Flints spread over the surface. A list of the fossils obtained is given, 136 species in all. R. B. N.

——. On a Shell Deposit near Largs. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 322–324. With remarks by **Mr. Wünsch, Mr. John Young,** and **Mr. James Thomson.**

Notes on a remarkable feature connected with this deposit, the great abundance of *Pecten maximus*; and adhering to one of these was a large *Balanus porcatus*. The Mollusca found in this deposit still live in the neighbouring seas. R. B. N.

——. Upon the Discovery of Marine Forms at a Higher Level than previously known in the Neighbourhood of Glasgow. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 333, 334.

These Ostracoda were found in laminated clay from the sewer in Campbell Street, 102 feet above the sea, the highest level at which marine fossils have been found near Glasgow. R. B. N.

Roemer, [Prof.] Ferdinand. [Geology of Ireland.] *N. Jahrb.* Heft i. pp. 64–74.

Gives a sketch of the Geological Survey, and describes the geological collections in Dublin. Notes on excursions in the S.W. and the N.E. of the country, and on the Earl of Enniskillen's Collection. Contains a table of the sedimentary rocks of Ireland, with remarks on their distribution. Regards the evidence of the existence of true Cambrian as unsatisfactory, and expresses the opinion, fortified by microscopic study, that both species of *Oldhamia* are inorganic. F. W. R.

Russell, R. Address to the Whitehaven Scientific Association. *Whitehaven News*, Oct. 11.

Contains references to Mr. Skertchly's discovery of brickearth, yielding palæolithic implements, beneath the Boulder Clay near Brandon, and to Victoria Cave. H. B. W.

Russell, R., and **T. V. Holmes.** On the Raised Beach on the Cumberland Coast, between Whitehaven and Bowness. *Trans. Cumb. Assoc.* pt. ii. pp. 68–70; and *Rep. Brit. Assoc.* for 1876, *Sections*, p. 95.

Lies 20 to 30 feet above present sea-level; its landward border is sometimes a cliff, sometimes a flat, 4 to 5 feet below the level of the old beach. It consists of ridges of sand and gravel parallel to the coast. Those near the sea are partly covered by blown sand. The elevation took place before the Roman occupation. W. T.

Sewell, Rev. E. Notes on the Drifts and Boulders of the Upper Part of the Valley of the Wharfe, Yorkshire. *Rep. Brit. Assoc.* for 1876, *Sections*, pp. 95, 96.

Gravels occur along the valley over the Boulder Clay. The Drifts have been cut through by the river to a depth of at least 150 feet. The gravels have probably been deposited by the sea during the gradual rise of the land. The boulders have come from W. and N. W. T.

Seymour, G. On the Occurrence of Tin in an Elvan Course at Wheal Jennings. *Trans. R. Geol. Soc. Cornw.* vol. ix. pt. 3, pp. 185–195, pls. i.–iii.

Describes the most important features connected with the geology of the mine. Considers some of the conditions under which the tin-deposit may have originated. R. B. N.

Shipman, J. Conglomerate at the Base of the Lower Keuper. *Geol. Mag.* dec. ii. vol. iv. pp. 497–499.

Describes sections near Nottingham.

Shrubsole, W. H. Geology of Sheppey. 2 pp. In 'Guide to Sheerness-on-Sea.' 8vo. *Sheerness.*

Account of the London Clay and its fauna and flora, and of a new well.

Skertchly, S. B. J. The Geology of the Fenland. Pp. xvi, 335; 24 plates (maps, sections, &c.), 36 woodcuts. *Geological Survey Memoir.* 8vo. *London.* 40*s.*

Chap. i. General Description of the Fenland &c. ii.–v. History of the Fenland. (Roman, Early English, Mediæval, and Recent Periods.) vi. Whittlesea Mere and the Shell Marl. vii.–ix. Rivers of the Fenland. x. The Wash. xi. Bicker Haven. xii. The Peat. xiii. The Buried Forests. xiv. The Fen Silt. xv. The Gravel. xvi. The Boulder Clay. (Remarks upon its age and origin.) xvii. The Denudation of the Fenland Basin and breaching of the Chalk Barrier. xviii. Inundations. xix. Meteorology. xx. Islands, Blown Sand, Nar Valley Beds, Woodhall Spa. *Appendices*:—A. Former Course of the Ouse; B. Peat and Peat Lands; C. Sections in the Fenland; D. List of Inundations; E. List of Heights; F. Meteorological Tables; G. Bibliography; H. Local and Obsolete Terms; I. List of Fossils from the Oolite Clay (Kimeridge and Oxford), by **R. Etheridge**; K. List of Species from the Fenland Strata. H. B. W.

Skertchly, S. B. J. The Antiquity of Man. *Nature*, vol. xvi. pp. 142, 163.

His discoveries prove man in E. Anglia to be inter-glacial, not pre-glacial. Brandon quartzite implements (see **Belt**, p. 4) are in gravel overlying Boulder Clay. C. E. R.

Smith, Charles. On a Section of Boulder Clay, Rampside. *Trans. Barrow Nat. Club*, vol. i. p. 25.

Smyth, Thomas. On the Occurrence of Chalk-Flint Nodules and Greenstone Boulders in the Post-Pliocene Sands (Stratified) at Marionville, Edinburgh. *Trans. Edin. Geol. Soc.* vol. iii. pt. 1, pp. 50–54.

Describes a descending series of sand with flints; laminated clay with flints; sand. A cluster of greenstone boulders, several weighing a ton, and one 2 tons, occurred in the upper sand. The greenstone resembles that of Ratho; and the chalk flints are thought to have come from Antrim. W. H. D.

Smyth, W. W. President's Address. *Trans. R. Geol. Soc. Cornw.* vol. ix. pt. 4, pp. xi–xxvi.

Contains a table giving the number of genera and species in the Old Red Sandstone and the Devonian Series of Great Britain, and the number of species in the Devonian Rocks of Rhenish Prussia, Belgium, and France. R. B. N.

Stoddart, W. W. Geology of the British Coal-field. Part 5 [should be Part 4]. The Triassic Period. *Proc. Bristol Nat. Soc.* n. ser. vol. ii. pt. 1, pp. 39–47. Part 6 [should be Part 5]. The Rhætic Period. pp. 48–55.

Describes the Dolomitic Conglomerate and Keuper Marls. Notices the minerals accompanying them, and gives analyses of dolomite, hæmatite, celestine, and red marls from near Bristol. Describes the locality where remains of *Thecodontosaurus* and *Palæosaurus* were obtained. The Bunter and Muschelkalk appear not to have been deposited in the Bristol area.

Divides the Rhætic Series into White Lias and Avicula-contorta Beds. Describes Aust Cliff in detail, also sections at Lock's Mill, Stoke Gifford, and Bedminster Down, with notes on the fossils. Gives a list of the principal fossils of the Rhætic Beds in the immediate neighbourhood of Bristol. H. B. W.

——. A Deep Section in Old Market Street [Bristol]. *Proc. Bristol Nat. Soc.* n. ser. vol. ii. pt. 1, pp. 77, 78.

Made ground 10 feet; Keuper (sandy marls and sandstone) 175 feet; Coal Measures 215 feet.

——. Fossil Microzoa of Clifton and the Neighbourhood. *Micr. Journ.* vol. xviii. p. 264.

Note on a paper read to the Bristol Microscopical Society, calling attention to the richness of the strata around Bristol in various microscopic forms of animal life. Alludes to the discovery of what appears to be a new species of insectivorous mammal from Post-Pliocene deposits in veins at Holwell. E. T. N.

Symons, R. Alluvium in Par Valley. *Journ. R. Inst. Cornwall,* no. xix. pp. 382–384.

The depth of this alluvium varies from 12 fathoms at the beach to 4 fathoms at Pont's Mill. A bed of granular tin is at its base, and rests on the rock. The shafts sunk at different times for the extraction of the tin are described. R. B. N.

Taylor, Andrew. On Metamorphism and Vulcanicity, as displayed by the Rocks of the Edinburgh District; suggested by Mr. Kinahan's paper on the Irish Rocks. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 135–139.

Advises the collection of topographical facts bearing on this subject, suggesting special points of inquiry in the Edinburgh district.

——. On the Comparative Ages of the English and Scottish Coal Fields, illustrated by the Geology of the Lothians and Fife, and the Structure of Arthur's Seat. *Proc. Geol. Assoc.* vol. v. no. 1, pp. 38–50.

Compares the views of Boué, Maclaren, Geikie, and Judd on the structure of Arthur's Seat. Thinks it doubtful if the various subdivisions of the Carboniferous rocks of England are contemporaneous with those having the same names in Scotland. W. T.

Taylor, Dr. J. E. Excursion to the Crag District of Suffolk. *Proc. Geol. Assoc.* vol. v. no. 3, pp. 108–113.

Notices coast-changes, London Clay, Red Crag, and phosphate-workings near Felixstowe; Chillesford Beds and Upper Red Crag near Orford; Coralline Crag near Sudbourne. The various sections were described by **W. Whitaker** and **Dr. J. E. Taylor,** and remarks made on the fossils by **E. Charlesworth.** W. T.

——. The Brandon "Finds." Pp. 101–104 of 'The East Anglian Handbook, Yearbook, and Scrapbook for 1877.'

An account of Mr. Skertchly's discovery of flint implements in supposed Glacial beds.

——. The Underground Geology of London. *Sci. Goss.* vol. xiii. pp. 147, 148.

Refers to the well at Meux's Brewery.

Taylor, Dr. William. The Gower and Doward Bone Caves. *Trans. Cardiff Nat. Soc.* vol. viii. pp. 79–95.

Describes the formation of caves and stalactites, and the ossiferous deposits of those named.

Terry, E. Photograph of a Section of Wenlock Shale from the Wren's Nest, Dudley, taken from a Microscopic Sketch. *Proc. Dudley Geol. Soc.* vol. 3. no. 5, p. 113; plate.

Shows fragments of Trilobites, Corals, and Brachiopoda filling the cup of a coral; magnified 576 times.

Thompson, Rev. J. H. Address, On Salt, at the Droitwich Field Meeting, May 29th, 1877. *Proc. Dudley Geol. Soc.* vol. 3, no. 5, pp. 126–128; woodcuts.

Remarks on brine-springs, with a geological map, transverse section, and vertical section of Red Marls, at Droitwich.

Thomson, James. On the Geology of the Island of Islay. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 200–222; map and 2 sections.

Contains the substance of a paper read before the British Association at Edinburgh.

——. On the Stratified Rocks of the Garpel Water, Muirkirk, Ayrshire. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 287–292.

A preliminary notice is given of the rocks found in the Strath, from Glenbuck to Ballochmyle. Records the occurrence of marine fossils in some thin layers of concretionary limestone which form the passage beds between the L. Carboniferous Rocks and the underlying Old Red Sandstone. These fossils are Carboniferous. R. B. N.

Tichborne, C. R. C. On the Occurrence of Magnetic Oxide of Iron at Kilbride, Co. Wicklow. *Journ. R. Geol. Soc. Ireland,* ser. 2, vol. iv. pt. 4, pp. 219–222.

The ore occurs in an extensive vein running N.W. and S.E. At the surface it is somewhat spongy, but becomes compact and dense as the depth increases. Although a magnetite, it contains excess of ferric oxide. The analysis shows it to contain from 40·10 to 72·46 of magnetic oxide; the sp. gr. is 4·31. A quantity sent to Staffordshire has been smelted with good results. Considers that this vein is of aqueous origin, but attributes the formation of the magnetic oxide to thermal influences under pressure on partially oxidized solutions. Describes laboratory experiments bearing out this point. E. T. H.

Tiddeman, R. H. Fourth Report of the Committee appointed for the purpose of assisting in the Exploration of the Settle Caves (Victoria Cave). *Rep. Brit. Assoc.* for 1876, pp. 115–118.

Laminated clay lies beneath the Pleistocene cave-earth as well as above it; the older clay may be the equivalent in time of the earlier Glacial beds in the S. of England. Additions to the fauna of the cave-earth are Marten and Weasel. The Rhinoceros remains found in the cave (see GEOLOGICAL RECORD for 1875, p. 39) are believed, by Prof. Busk, to belong to *R. leptorhinus.* W. T.

Topley, William. Notes on the Geology of Sussex. Pp. 16–23, *Tourists' Handbook of Sussex,* by G. F. Chambers. 8vo. *London.*

Sketches the geological history of the county; refers to the Sub-Wealden boring and the old iron-workings; gives a table of strata in Sussex, with the thickness of beds. W. T.

Topley, W., and G. A. Lebour. On the Intrusive Character of the Whin Sill of Northumberland. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 406–422, pl. xviii. (section); 5 woodcuts. [See GEOLOGICAL RECORD for 1874, p. 38.]

The Whin Sill is a bed (or beds) of basalt lying amongst the higher beds of the Carboniferous Limestone Series—the Yoredales of Phillips. Its range through the county is described; and proofs of its intrusive character are given—junctions with overlying sedimentary rocks, cutting through the beds, lying at various horizons through 1000 feet of strata. The Whin Sill is older than most faults of the district; and many considerations point to its being probably pre-Permian; but there is no proof. There are no known "necks" up which the trap has come; so probably these lie E. of the outcrop. References to previous writers are given. W. T.

Traill, W. A. On Certain Pre-Carboniferous and Metamorphosed Trap-Dykes, and the Associated Rocks of North Mayo, Ireland. *Rep. Brit. Assoc.* for 1876, *Sections*, p. 97 (and *Geol. Mag.* dec. ii. vol. iii. pp. 558–560, 1876).

The metamorphic schists and quartzites are penetrated by basalt-dykes. Pebbles of all these rocks occur in the basal bed of the overlying Carboniferous series, which consists of sandstones and shales, followed by limestone. The older dykes are altered, never columnar or spheroidal, and rarely vesicular or amygdaloid. All these characters are found in the newer dykes, probably Miocene. W. H. D.

Ussher, W. A. E. A Chapter on the Budleigh Pebbles. *Trans. Devon. Assoc.* vol. ix. pp. 222–226.

Refers to a paper by Rev. P. B. Brodie, in which is recorded the occurrence of quartzitic pebbles in Warwickshire like those of Budleigh Salterton, and shows from their geological position that it is impossible that Budleigh pebbles could have travelled into the Midland counties during Triassic times. Discusses the origin of the Budleigh deposits. T. M. H.

——. On the Age and Origin of the Watcombe Clay. *Trans. Devon. Assoc.* vol. ix. pp. 296–300.

The clay-pits are near Torquay, 300 feet above the sea. Regards the deposit as part of a basement series of clays and fine breccia, subordinate to the breccia and breccio-conglomerates of the Trias. T. M. H.

——. A Classification of the Triassic rocks of Devon and West Somerset, with some observations on the variability of strata. *Trans. Devon. Assoc.* vol. ix. pp. 392–399.

Compares these Triassic rocks with those of the Midland counties, and proposes to divide the infra-Keuper beds of the former into two, defined by lithological characteristics and stratigraphical relations:—*Middle Trias*: Marls and passage marls and sandstones. *Lower Trias*: Sandstones (locally clays) and breccia, and breccio-conglomerates. Considers the upper part of these as of Muschelkalk age, without implying that it is the stratigraphical equivalent of that formation alone, as part of the L. Trias may have been contemporary with its earlier stages. Regards the latter group as in part or altogether representative of the Bunter. T. M. H.

Walker, C. An Excursion to the Norfolk Coast. Mundesley, Happisburg. *Nat. Hist. Journ.* vol. i. p. 42.

Ward, J. C. Remarkable Boulders of the Keswick District. *Trans. Cumb. Assoc.* pt. ii. pp. 71–75.

Some have been transported by land-ice in the direction of the glacial striæ, some by floating ice.

——. Jonathan Otley, the Geologist and Guide. *Trans. Cumb. Assoc.* pt. ii. pp. 125–169.

Biography, with letters touching on the geology of the Lake District, by **J. Otley, Prof. Phillips, Prof. Sedgwick,** and **J. Farey.**

Whitaker, William. Note on the Red Crag. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 122, 123.

The supposed irregular line of erosion between a certain unfossiliferous sand and the shelly Red Crag (in Suffolk) is really a line of dissolution of shells, the sand being simply Red Crag deprived of its fossils through percolation of water. This is proved by lines of bedding and false-bedding extending from the Crag into the sand, and from impressions of Crag shells being found in ironstone in the sand. W. W.

——. The Geology of the Eastern End of Essex. (Walton Naze and Harwich.) Pp. 32. *Geological Survey Memoir.* 8vo. *London.* Price 9*d.*

Describes the physical geography, the London Clay, Red Crag, Drifts, and Recent deposits. Appendices of well-sections and of lists of fossils. W. H. D.

——. Some Questions relating to the Water Supply of London. *Ann. Rep. Soc. Med. Off.* pp. 19–21.

Notices the water-bearing beds (Chalk and L. Greensand), suggesting prevention of waste, and that deep borings might reach Jurassic or Triassic beds. W. H. D.

Willett, Henry. Sub-Wealden Exploration. 15th and Final Report. Pp. 7. 8vo. *Brighton.*

Notes proceedings since March 1876.

Williams, W. M. Hog-Wallows and Prairie Mounds. *Nature*, vol. xvi. pp. 6, 7.

Compares these with mounds of Glacial Drift in Cheshire.

Wilson, E. The Magnesian Limestone and New Red Sandstone in the Neighbourhood of Nottingham. *Geol. Mag.* dec. ii. vol. iv. pp. 238–240.

Suggests that the overlap of the Bunter on the Permian is one of conformity.

Wood, S. V., Junr. The Tropical Forests of Hampshire. *Geol. Mag.* dec. ii. vol. iv. pp. 95, 96, 141, 187, 188.

Suggests that the intermixture of tropical and temperate plants in the L. Bagshot of Hampshire is due to a river flowing from a mountainous region, attaining to temperate isothermals, into tropical low grounds. W. H. D.

Wood, S. V., Jun., and F. W. Harmer. Observations on the Later Tertiary Geology of East Anglia. With a note by **S. V. Wood** on some New Occurrences of Species of Mollusca in the Crag and Beds superior to it. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 74–121; 24 woodcuts.

Accepts Mr. Whitaker's opinions (see p. 42) that some of the unfossiliferous sands above the shelly Red Crag are the Crag itself altered by the percolation of acidulated waters; they cannot, however, represent the Chillesford Beds. The valleys of E. Anglia were excavated after the deposition of the Contorted Drift, but before that of the M. Glacial Beds. These last lie in the valleys, and partly spread over the higher ground; the U. Glacial Beds spread more widely. The modern valleys have generally been excavated along the old lines; but some have not, as the old S.E. course of the united Yare and Waveney. The beds above the L. Glacial were probably formed as follows:—During resubmergence the land-ice of N. Britain accumulated and descended into the lower grounds, destroying the L. Glacial Beds. The material brought by this land-ice was sorted by currents, forming the M. Glacial Beds. Increased submergence ended this current-action; the moraine material of the glaciers was carried into deep water, and formed the U. Glacial Beds. For Note by **S. V. Wood**, see *post*, under INVERTEBRATA. W. T.

——, ——. The Kessingland Freshwater Bed and Weybourne Sand. *Geol. Mag.* dec. ii. vol. iv. pp. 385–389.

Replies to Messrs. Blake and Reid's criticisms (see pp. 5, 34), suggesting that Reid's Freshwater Bed (no. 2) is ice-transported masses of peat, insisting on the passage of the Weybourne sands into the Till, and objecting to the severance of those sands from the Glacial Series. W. H. D.

Woodward, H. B. Notes on the Devonian Rocks near Newton Abbot and Torquay, with Remarks on the Subject of their Classification. (*Brit. Assoc.*) *Geol. Mag.* dec. ii. vol. iv. pp. 447–454.

The basement-beds of the Devonian are truly Old Red Sandstone, whilst the succeeding slates and limestones are Carboniferous.

——. A Sketch of the Geology of Plymouth and the Neighbourhood. *Sci. Goss.* vol. xiii. pp. 169–173.

Describes the various formations of Devonshire.

——. A Sketch of the Geology of Kent. Pp. 45–48 of *The Saturday Half-Holiday Guide.* Ed. 9 [for 1877]. 8vo. *London.*

The rocks are Hastings Beds to London Clay. The general range and character of these are given; and there are notes on the distribution of the gravels and brickearth. W. T.

Wright, Dr. T. On the Geological and Palæontological Characters of the Country around Bristol. *Coll. Guard.* vol. xxxiii. pp. 601, 602, 641, 642.

An account of the Geology and Palæontology of Tortworth, Mendip, Radstock, Bristol, Dundry, and Bridgewater, with a table of the formations in the district. R. B. N.

Wünsch, [E. A. G.] Columnar Sandstone in Arran. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 324, 325. With remarks by **Mr. John Young** and **Mr. D. C. Glen.**

In the New Red Sandstone, on the shore, half a mile S. of Lamlash.

——. On the Junction of the Granite and Old Red Sandstone at Corrie and Glen Sannox, Arran. *Rep. Brit. Assoc.* for 1876, *Sections*, pp. 98, 99.

Near the junction the Old Red Sandstone is much altered, and has been wrongly described as "slate." At the junction the granite is delicately mottled or clouded; this is not the case in other parts of the island. The granite is against true slate. W. T.

Wyatt, James. On the Geology of Sandy. *Trans. Bedf. Nat. Hist. Soc.* for 1875–76, pp. 42–44.

Describes the L. Greensand.

——. On Land and Freshwater Shells found in the Bedford Gravels. *Trans. Bedf. Nat. Hist. Soc.* for 1875–76, pp. 76–82.

Describes the formation of the gravels, giving a list of shells.

Young, John, and D. Robertson. Note on the Polyzoa of the Hairmyres Limestone Shale, East Kilbride. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 173–175.

Note the position of the bed, and give a list of the Polyzoa.

Young, R. A Volcanic Ash Deposit at the Cave Hill Quarries. *Proc. Belfast Nat. Hist. Phil. Soc.* Session 1876–77, pp. 51, 52.

Notices a "bluish earthy matter with a soapy feel" at the junction of the Chalk and the overlying trap rocks of Cave Hill. This substance is probably derived from the ashes emitted from the volcano whence the lava was afterwards poured forth. R. B. N.

Geological Survey of Scotland. Explanation of Sheet 9 by **Prof. A. Geikie, J. Horne, H. Skae,** and **R. Etheridge, Jun.**

The area described includes the N.E. part of Kirkcudbright, and the S.W. part of Dumfriesshire. The Formations are:—Recent and Post-Tertiary, including Alluvium, Peat, and Raised Beaches; Drift, including Moraines, Erratic blocks, Sand and Gravel, Till and Boulder Clay; Permian, including Red Sandstones and Volcanic rocks; L. Carboniferous, including Red Sandstones and Limestones; L. Silurian, including Caradoc Series, with its Subdivisions of Greywackes and Grits, and Shinnel and Chanloch Conglomerates; and the Llandeilo Series with its Subdivisions (Carsphairn Group, Upper or Lead Hills Black Shale Group, Lowther Group, Dalveen Group, Lower or Moffat Black Shale Group, and Ardwell Group); Metamorphic rocks, including Quartz-rock, Lydian Stone, and altered Silurian rocks passing into fine-grained Gneiss; Igneous rocks, including Miocene Basalt Dykes, Permian Porphyrite and Tuff, and Dioritic rocks, Felstones, Syenites, and Granite associated with L. Silurian rocks. An appendix gives lists of fossils and localities. J. S. G-W.

Second Report of the Committee on Scientific Memoranda. *Trans. Devon. Assoc.* vol. ix. p. 73.

ix. Palæontological, pp. 84–86. Notes the discovery of horns, bones, &c. at Torquay and Sidmouth.

See also:—

Ammon, L. von. Dorset Purbecks: p. 49.

Bingham, Rev. C. W. Dorset. *Encyclopædia Britannica*: *post*, at end of MISCELLANEOUS.

Dollfus, G. Tertiary Beds, Newhaven: p. 60.

Fowler, Rev. J. T. Durham. *Encyclopædia Britannica*: *post*, at end of MISCELLANEOUS.

Geikie, J. The Great Ice Age: *post*, under PHYSICAL GEOLOGY.

Hutchinson, Rev. —. Charnwood Forest: *post*, under PETROLOGY.

King, R. J. Devonshire. *Encyclopædia Britannica: post*, at end of MISCELLANEOUS.

Topley, W. Sub-Wealden Exploration: under *Science Conferences*, at end of MISCELLANEOUS.

Ward, J. C. Cumberland: under *Encyclopædia Britannica*, at end of MISCELLANEOUS.

Wood, S. V., Jun. British Surface Geology: *post*, under AMERICA.

SUPPLEMENT FOR 1874–1876.

Anon. Field Meetings in 1875. *Proc. Dudley Geol. Soc.* vol. 3, no. 2, pp. 15-18. [1876.]

Notes on basalt of Wednesbury, Permian of Ankerdine, basalt and Coal Measures of Dudley, physical geography of Wenlock Edge, &c.

Beckett, H. (the late). The Geology of Enville. *Proc. Dudley Geol. Soc.* vol. 3, no. 2, p. 23. [1876.]

The Permian overlies Coal Measures with igneous rocks.

Bishop, P. J. The Channel Railway: Tube or Tunnel. Pp. 22. 8vo. *London.* [1876.]

Gives geological and other reasons against the Tunnel scheme.

Craig, Robert. On the first Appearance of certain Fossils in the Carboniferous Strata around Beith and Dalry. *Trans. Geol. Soc. Glasgow*, vol. v. pl. i. pp. 36–50. [1875.]

The rocks are L. Carboniferous, 900 feet thick, resting on Ash. Table of distribution through 60 feet of fossiliferous rocks.

Cruttwell, A. C. Synopsis of the Glacial Period in Great Britain. *Rep. Cardiff Nat. Soc.* pp. 81–85. [1874.]

The various beds of this age are described, with the accompanying changes of climate and physical geography.

Evans, John. Water-Supply of the Metropolis. *Nature*, vol. xiii. p. 425. [1876.]

A reply to Dr. Frankland (see below).

Frankland, Dr. E. The Water-Supply of the Metropolis. *Nature*, vol. xiii. pp. 392, 393. [1876.]

A reply to Mr. Evans's criticisms (see GEOLOGICAL RECORD for 1876, p. 322). Refers to the water-bearing capacity of the Chalk.

Heming, W. T. The Lickey Hills. *Proc. Dudley Geol. Soc.* vol. 3, no. 2, pp. 19, 20. [1876.]

Llandovery and Wenlock Beds under Permian, Trias, and Drift.

Hogg, Jabez, Dugald Campbell, and **S. C. Homersham.** A Microscopical Examination of certain Waters submitted to J. Hogg, and a Chemical Analysis by D. Campbell, with introductory notes by S. C. Homersham. Pp. 27. 3rd ed. 8vo. *London.* [1874.]

Chalk waters of London district; Surface-waters near Wakefield; New Red Sandstone water of Selby and Little Heck, Yorkshire.

Hughes, Prof. T. McK. On the Evidence for Preglacial Man. *Proc. Camb. Phil. Soc.* vol. iii. pt. i. pp. 16, 17. [1876.]

Criticises unfavourably the evidence of interglacial Man adduced by Tiddeman and Skertchly.

Hull, Prof. Edward. Explanatory Memoir to accompany Sheets 21, 28, and 29 of the Maps of the Geological Survey of Ireland. With Palæontological Notes by **W. H. Baily.** 8vo. *Dublin.* Woodcuts. [1876.]

The district referred to, in Antrim, extends from the N.W. quarter of Lough Neagh, E. to Belfast Lough, and N. towards Larne, and contains the towns of Antrim, Ballyclare, and Randalstown. The following formations occur:—*Triassic,* Bunter Sandstone stretching some way along the coast; and Keuper Marls, at the base of the Chalk escarpment to the west. These marls contain gypsum and rock-salt, which latter, near Carrickfergus, occurs in quantity, and is worked. *L. Lias* and *Rhætic Beds* crop out from beneath the Cretaceous beds between Whitehouse and Larne, there being an important section at the latter place. *Cretaceous Beds:* these form a narrow band between the Lias and the Basalt, and are represented by U. Greensand containing much protosilicate of iron, and U. Chalk with flints. The Chalk contains many microscopic Foraminifera, and is much quarried.

TERTIARY VOLCANIC ROCKS. *U. Eocene:* Trachyte, Porphyry, and Rhyolite occur at Tardree (where was probably the volcanic vent), Carnearney, and Templepatrick. Its microscopic structure is given, and chemical analysis by **E. T. Hardman.** *Miocene:* Basalt, Dolerite, Lower and Upper, sheets with interbedded layers of bole, volcanic ashes, iron-ore, and lignite. The latter, as at Ballypalidy, contains leaf-beds containing Miocene plants, corresponding with those in the Basalt of Mull. The iron-ores (hæmatites) and the lithomarge are extensively worked, and are very valuable; they appear to be of lacustrine origin. Volcanic rocks are seen in several places; and basaltic dykes are numerous. The *Drift Deposits* consist of L. Boulder Clay, Gravels, and U. Boulder Clay; and an extensive Raised Beach occurs near Larne. Microscopical Notes by **Prof. Hull** are added. E. T. H.

Jenkinson, H. I. Practical Guide to the English Lake District. Ed. 5. Geol. Map. 8vo. *London.* Price 6*s*. [1876.]

Geology, pp. xli–lxii. Mineralogy, by **B. M. Wright,** pp. lxxi–xciii.

Jukes, Prof, J. B. (the late). Dudley Caverns. *Proc. Dudley Geol. Soc.* vol. 3, no. 2, pp. 20–22. [1876.]

Describes the mode of formation of the Wenlock Limestone and Coal Measures.

Kinahan, G. H., R. G. Symes, S. B. Wilkinson, J. Nolan, and **H. Leonard.** Explanatory Memoir to accompany Sheets 73 and 74 (part of), 83 and 84 of the Maps of the Geological Survey of Ireland. With Palæontological Notes by **W. H. Baily.** Pp. 82. 8vo. *Dublin.* Woodcuts. [1876.]

Illustrates the Geology of the intricate district in Mayo and Galway, comprising Westport, Errif Valley, Killary Harbour, and the W. shores of Lough Mask, together with Clare and other islands in the Atlantic. *General Description*:—1. Form of the Ground, pp. 9–15. 2. *Formations* (briefly described), pp. 15–25, include granite, elvanite, felstones, and felstone-porphyries of 4 Silurian periods, basic tuffs, diorites, dolerites, and melaphyres; metamorphic schists, limestones, quartzites, serpentines, steatite, &c.; L. and U. Silurians, Carboniferous, Boulder Clay, Moraine Drift, Post-glacial Gravels, &c., Alluvium, and Bog. 3. *Relation between Form of Ground and Internal Structure*, pp. 25–27. Microscopic Notes by **Prof. Hull**, 33, 34. *Detailed Description*, 34–74. Table of Ice Striæ, showing 5 distinct sets, pp. 75–81; ditto in N. part of district, p. 82. In a preface, **Prof. Hull** states the grounds for regarding the metamorphic rocks as not older than L. Silurian, and for differing from the conclusions of Griffith, who had placed them in the Cambrian, and in some cases lower. E. T. H.

Lessert, A. de. Wyre Forest. *Proc. Dudley Geol. Soc.* vol. 3, no. 2, p. 22. [1876.]

Note on Coal Measures.

Lukis, J. W. The Flint Implements of the Drift Period. *Rep. Cardiff Nat. Soc.* for 1873, pp. 28-34. [1874.]

Describes their occasional presence in Drift gravels and bone-caves, and their nature and use. Mentions the chief places at which they have been found. T. V. H.

Molyneux, W. Trentham Gravel Beds. *Proc. Dudley Geol. Soc.* vol. 3, no. 2, pp. 32, 33. [1876.]

Describes Bunter conglomerate. See Geological Record for 1875, p. 30.

Thompson, Rev. J. H. The Hayes near the Lye and Cradley. *Proc. Dudley Geol. Soc.* vol. 3, no. 2, p. 19. [1876.]

Coal Measures and Ludlow Beds.

——. Habberley Valley, Trimpley, and Areley. *Proc. Dudley Geol. Soc.* vol. 3, no. 2, pp. 31, 32.

Permian breccia, Coal Measures, and basalt.

2. *EUROPE.*

Sub-Editor Prof. G. A. Lebour, F.G.S.

Abella, Enrique. Datos topográfico-geológicos del Concejo de Teverga, provincia de Oviedo. [Geology, &c. of Teverga.] *Bol. Com. map. geol. Españ.* t. iv. 251–256, pl. G (geol. map and sections).

Coal and iron are found at Teverga; but to what extent is not known.

Alglave, É. Un voyage scientifique en Auvergne. Excursion dans le Cantal, etc. [Scientific Tour in Auvergne.] *Rev. Sci.* 2 sér. t. xiii. pp. 774–781, 800–807, 868–872.

Account of M. Ramès' views of the Geology of the Cantal volcanos, laid before the French Association for Science, &c.

Alth, Dr. A. von. Die Gegend von Nizniow und das Thal der Zlota Lipa in Ostgalizien. [Geology of Part of E. Galicia.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. pp. 319–340.

In the valley of the Zlota Lipa are seen the Old Red Sandstone (which has a wide extension in Podolia), limestone with *Stromatopora* (which may be Devonian), and limestone and dolomite (which, from containing *Gyroporella*, are supposed to be Trias). Above the supposed Trias of Muschelkalk limestone are Cretaceous and Tertiary beds. E. B. T.

——. Sprawozdanie z podrozy odbytej w r. 1875 w niektorych czesciach Podola Galicyjskiego. [Researches and Travels in 1875 in Galician Podolia.] *Sprawozd. Kom. Fiz. Krakow*, t. xi. p. 198.

——. Stosunki topograficzno-geologiczne kolei Tarnowsko-Leluchowskiej. *Ibid.* p. 219.

Ammon, L. von. *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 198, 199.

Note on Dorset Purbecks, and on the discovery of *Terebratula janitor* in red limestone near the top of the Wendelstein (Alps).

Angelin, N. P. Geologisk öfversigts-karta öfver Skåne, med åtföljande text. [Geological Map of the Province of Skåne in Sweden (see *post*, under Maps), with Description.] Edited, after the author's death, by **Dr. B. Lundgren.** Pp. 83. 8vo. *Lund.*

The formations described are:—Silurian (10 divisions), U. Silurian (3 divisions), Keuper (3 divisions), Lias (6 divisions), Chalk (5 divisions), Tertiary (2 divisions), Glacial (5 divisions), Postglacial, Metamorphic and Plutonic rocks, Volcanic rocks. There is a supplement by **Dr. Lundgren**. The manuscript was compiled about 20 years ago. E. E.

Anon. Excursions géologiques, 1875–1876. *Bull. Soc. Géol. Norm.* t. iii. pp. 40–51.

Accounts of Excursions in the neighbourhood of Havre, and in Calvados and La Manche.

——. **[K. P.]** Account of Hickmann's Geological and Mining Map of Bohemia. *Verh. k.-k. geol. Reichs.* p. 157.

——. Une montagne qui s'écroule. [A falling Mountain.] *Rev. Sci.* t. xiii. pp. 139, 140.

Above the hamlet of Miroir, Savoy, the mountain-slopes, consisting of diluvial blocks and gravel, had for some time showed incipient fissures. A considerable slip finally occurred, not destroying the village, but burying with débris much cultivated land. E. B. T.

——. Les Houillères françaises. Les mines de Lens. [French Coal-fields. The Lens Collieries.] *Rev. Sci.* 2 sér. t. xiii. pp. 1230–1238.

Account of these mines (Pas de Calais), number of shafts, seams, men employed, and output from each.

——. Metallurgy and Coal Mining in Russia. *Coll. Guard.* vol. xxxiv. pp. 780, 863, 864, 1029, 1030.

Gives an account of the Coal-basin of Central Russia, stating the thickness of the layers. The iron and coal districts of the Ural are also mentioned. R. B. N.

——. Sur les gisements de chaux phosphatée de l'Estramadure. [Phosphates of Estramadura.] 8vo. *Paris.*

Aranzazu, J. M. de. Apuntes para una descripcion Fisico-Geologica de las provincias de Burgos, Logroño, Soria, y Guadalajara. [Geology of Burgos, Logroño, Soria, and Guadalajara.] *Bol. Com. map. geol. Españ.* t. iv. p. 1, pl. A (geol. map).

Geology, Pt. 2, pp. 26–47. These provinces have a very uneven surface; and the following formations occur:—Alluvial, Quaternary, M. Tertiary, Cretaceous, Jurassic, Triassic, Carboniferous, Devonian, Silurian, Crystalline, and a few patches of Igneous rocks. A brief account of each is given. In Burgos the seams of coal are from 30 centimetres to a metre thick, and are worked on a small scale. Carboniferous fossils are abundant. Gypsum and salt-springs abound in the Trias. Fossils are abundant in the Jurassic and Cretaceous rocks. The M. Tertiary abounds in freshwater shells; and thick beds of gypsum and alabaster are found in it. The bedding is horizontal or slightly inclined. In the

Cretaceous, bituminous coal, inclined 60° to 70° N.W., has been worked on a small scale. There are Cretaceous sandstones impregnated with asphalt and containing carbonate of copper. The sulphate of soda found along with the Tertiary gypsum has been worked for many years. Silver and lignite have been worked in Guadalajara. Salt is obtained from the Trias; veins of lead and copper, with silver, iron, and manganese, have long been worked. Building-stone, lithographic stone, and ornamental marble are worked. The map shows 11 divisions. J. F.

Arnaud, H. Études pratiques sur la craie du Sud-Ouest.—2ᵉ partie. Profils géologiques des chemins de fer des Charentes, région crétacée. [Railway-sections, Charente.]—3ᵉ partie. Profils géologiques des chemins de fer d'Orléans, région crétacée. [Sections on Orleans Railway.] *Act. Soc. Linn. Bordeaux*, t. xxxi., or ser. 4, t. i. pp. 168–201, 251–286; 16 pls. (sections). See GEOLOGICAL RECORD for 1874, p. 47.

Descriptions of railway-cuttings through the Chalk of S.W. France, under the following principal divisions:—L. Chalk, Cenomanian, Ligerian; M. Chalk, Angoumian, Provencian; U. Chalk, Coniacian and Santonian, Campanian, Dordonian. Each stage has several subdivisions with lithological or palæontological distinctions.

Part 3. From Négrondes to Trentels, from Mussedan to Thenon, and from Angoulême to La Rochechalais. W. G.

Artigue, H. Étude sur l'Estuaire de la Garonne et la partie du littoral comprise entre la pointe de la Coubre et la pointe de la Négade. [Notes on the Garonne Estuary.] *Act. Soc. Linn. Bordeaux*, t. xxxi., or ser. 4, t. i. pp. 287–307; 4to atlas of chart and 5 pls.

An account of the geological changes which have taken place near the estuary between 1825 and 1875. Thinks that no important change in the sea-level has taken place in these 50 years, and that the existence of old forests on the shore near low-water mark, the diminution of the island of Cordouan, the deepening of certain parts of the gulf, and the supposed sinking of the lighthouse of Cordouan can be explained without resort to the theory of a subsidence of the earth, and that they are due to the general low altitude of the land, the friability of the soil, the constant progress of phenomena provocative of denudation, and the submersion of the low ground bordering the estuary by the augmentation in breadth of the waters consequent upon a diminution in depth. W. G.

Attman, J. Bergöl in Galizien. [Mineral Oil in Galicia.] *Verh. k.-k. geol. Reichs.* p. 72.

Announces the discovery of mineral oil in considerable quantities 14 fathoms down in a shaft near the Truskawice baths.

Baltzer, A. Beiträge zur Geognosie der Schweizer-Alpen. [Contributions to the Geology of the Swiss Alps.] *N. Jahrb.* **Heft vii.** pp. 673–692 [misprinted 962]; 2 plates.

A continuation (see Geological Record for 1876, p. 47). Describes (1) the deposit of marble on the N. edge of the crystalline rocks of the Finsteraarhorn; (2) a peculiar disposition of strata on the border of the gneiss and limestone at the same place. The marble is in many parts evidently an altered Jurassic limestone, the metamorphism having probably resulted from mechanical causes, and not from heat due to contact with eruptive rocks. The strata described are peculiarly contorted, and are enclosed in gneiss. Repeats his opinion that the complicated folds in such rocks have been produced after they had been perfectly hardened. The more clay in the constitution of the rock the greater is its plasticity. F. W. R.

Baretti, Martino. Studî geologici sul gruppo del Gran Paradiso. [Geology of the Gran Paradiso group.] *Atti R. Ac. Linc.* ser. 3, vol. i. pp. 46–49. (Abstract.)

The rocks are correlated with the Laurentian, Huronian, and L. Silurian.

Barrois, Dr. Charles. Note préliminaire sur les terrains paléozoïques de l'Ouest de la Bretagne. [First note on the Palæozoic rocks of W. Brittany.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 266–271.

States that the unconformity formerly believed to be found between Silurian and Cambrian in W. Brittany does not exist, the appearance being due to a large fault. Sees no reason to admit that any of these rocks are of Cambrian age. Notes a number of subdivisions belonging to Silurian and Devonian. G. A. L.

——. Note préliminaire sur le terrain silurien de l'ouest de la Bretagne. [Silurian of W. Brittany.] *Ann. Soc. Géol. Nord,* t. iv. p. 38–57; section.

Gives a geological sketch of the district, distinguishing the beds under the following names:—Green schists of Douarnenez, red schists of Cape la Chèvre, white sandstone of the Black Mountains, Morgat schists, Plougastel schists, Dinan ampelites, Devonian beds. Draws attention to an important fault, which had escaped previous observers, along the valley of the Elorn, and gives a section to show the relations of the several formations, as well as a table comparing the beds in the different basins of Brittany. A. J. J-B.

——. [Notice of the occurrence of *Pecten Hasbachii* in M. Devonian at Gussegnies.] *Ann. Soc. Géol. Nord,* t. iv. p. 58.

——. Le Terrain Dévonien de la Rade de Brest. [The Devonians of Brest Harbour.] *Ann. Soc. Géol. Nord,* t. iv. pp. 59–105.

Calls attention to the general result of his researches, and to the close correspondence of the Devonian series of Brittany with that of

Nassau (Bassin de la Lahn). Notices the works of previous authors, and describes the beds in the following order:—1. White Sandstone of Landévennec (with *Grammysia Hamiltonensis*). List of fossils, and observations on its fauna. 2. The Grauwacke of Le Faou (with *Chonetes sarcinulata*); its subdivisions and fossils, three zones being recognized,—grauwacke, limestone, schists. 3. Schists of Porsguen (with Cephalopoda). These are rich in fossils; and the fauna resembles that of the Wissenbach schists. This correspondence is discussed, and shown in a table comparing the members of the Lower Devonian formation in Brittany, Nassau, and Ardenne. A. J. J-B.

Barrois, Dr. Charles. Les Minerais de fer de la Bretagne. [Iron-ores of Brittany.] *Ann. Soc. Géol. Nord*, t. iv. pp. 130–136.

Iron is found principally in Brittany:—1. In Cambrian rocks. 2. In the Silurian, between the *Scolites* sandstone and the *Calymene Tristani* schists; this ore is mainly developed in the basins of Rennes and of Normandy. 3. In the Devonian, at the base of the white sandstone of Landévennec, in the basin of Finistère, where it forms a regularly stratified layer, and has no relation to the hornblendic rocks, as has been thought. A. J. J-B.

——. Note sur les traces de l'époque glaciaire en quelques points des côtes de la Bretagne. [Traces of the Glacial Epoch on the Coasts of Brittany.] *Ann. Soc. Géol. Nord*, t. iv. pp. 186–204, illustration.

In the Bay of Kerguillé Dr. Barrois found a deposit which he names "Kerguillé Conglomerate." It is banked up against Silurian schists to a height of 30 feet above sea-level; the pebbles composing it are of quartz, quartzite sandstone, breccia, gneiss, granite, syenite, quartz porphyry, hornblendic porphyry, and diorite, most of them being referable to rocks on the coast of Brittany further W. Finds a difficulty in considering this an ordinary marine deposit, and attributes its formation to the agency of icebergs. Compares it to the raised beaches on the S. coast of England, and discusses the general movement of depression which took place at this time. A. J. J-B.

——. Relation d'un voyage géologique en Espagne. [Geological Excursion in Spain.] *Ann. Soc. Géol. Nord*, t. iv. pp. 292–303; and (in Spanish) in *Bol. Com. map. geol. Españ.* t. iv. pp. 373–382.

Gives a sketch of the geology of Galicia, the Asturias, and the Basque provinces. The oldest rocks (Cambrian) are found in Galicia; in the Asturias also there are beds with a Primordial fauna, succeeded by sandstones and slates; above these are Devonian and Carboniferous strata, succeeded by Trias, Lias, and Cretaceous beds. The greater part of the Basque provinces is occupied by U. Cretaceous beds of schist, sandstone, and limestone. A. J. J-B.

Bell, D. On the Geology of Switzerland. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 236–238. (Abstract.)

An epitome of some observations made on a recent visit.

Belt, Thomas. On the Loess of the Rhine and Danube. *Quart. Journ. Sci.* vol. vii. pp. 67–90.

From the boulders and freshwater shells in the loess (of which many details are given) it is regarded as produced in an immense lake, bounded by an ice-barrier, which, stopping the northward progress of vapour, continually advanced southward down the Atlantic, damming back the drainage of Europe, Asia, and America. W. H. D.

Benoist, E. A. Observations faites au Planta, commune de Saint-Morillon, sur la position stratigraphique des couches de terrains de cette contrée. [Geology of Planta.] *Compt. Rend. Soc. Linn. Bordeaux*, t. xxxi. pp. xxxviii, xxxix.

Describes 8 beds of limestone, marl, and sand, and notes their contained fossils, some of which are freshwater.

——. Fossiles du calcaire de Mons (Belgique). [Fossils of the Mons Limestone.] *Compt. Rend. Soc. Linn. Bordeaux*, t. xxxi. pp. xliv, xlv.

Gives a short description of the Calcaire grossier of Mons, in Belgium, 93 metres thick, and containing upwards of 400 species of fossils; and of some exploring shafts sunk 20 metres in it. W. G.

——. Le calcaire de Saint Estèphe à Cenon. [St. Estèphe Limestone.] *Compt. Rend. Soc. Linn. Bordeaux*, t. xxxi. pp. xlix–lii, plate.

Describes the beds at Cenon in 3 groups:—the upper, composed of different kinds of limestone, 15 metres thick; the 2nd, principally of clayey limestone, 16 metres; the 3rd, almost entirely clayey, 6·3 metres thick, is classed as Eocene, the other two as Miocene. Characteristic fossils are noticed; and a plate shows the subdivisions. W. G.

——. Sur une *prétendue formation aliotique* dans les dépôts quaternaires de notre région. [Alleged recent formation in Quaternary, Bordeaux.] *Compt. Rend. Soc. Linn. Bordeaux*, t. xxxi. p. lxix.

Benoit, Emile. Note sur une expansion des Glaciers alpins dans le Jura central par Pontarlier. [On the extension of the Alpine Glaciers into the Jura by way of Pontarlier.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 61–73, pl. iii.

Discusses the subject. A map shows the mean heights of the mountains (by means of rough contours), the lines of dispersal of the Alpine boulders, and the moraines in the Jura. G. A. L.

Bertrand, Al. Découverte d'un port gallo-romain et d'un port gaulois, datés par l'étude des couches de vase, dans le voisinage de Saint-Nazaire. [Discovery of a Gallo-Roman port and a Gallic port, dated by the study of the mud-deposits, near St.-Nazaire.] *Compt. Rend.* t. lxxxiv. pp. 690–694, 752–754, figure (section) in text.

Describes the beds and their contents. The ports were in the old valley of the Brivet, which then flowed into the Loire at Penhouët. The old deposits rest on rock at a depth of 27 metres. G. A. L.

Boeckh, Johann. Bemerkungen zu der "Neue Daten zur geologischen und paläontologischen Kenntniss des südlichen Bakony" betitelten Arbeit. [Remarks on a paper by Von Hantken.] *Jahrb. k. ung. geol. Anst.* Bd. vi. Heft i. pp. 1–22.

Answer to criticisms of Von Hantken (see GEOLOGICAL RECORD for 1875, p. 69). New names, *Cerithium Hantkeni* and *Pholadomya Hantkeni*, are proposed for *Cerithium Fuchsi* (Hant.) and *Ph. rugosa* (Hant.) respectively preoccupied. E. B. T.

——. [Account of work done in Hungary during 1876.] *Verh. k.-k. geol. Reichs.* no. 1, pp. 11–14.

Short résumé relating chiefly to the geology of part of the Baranya and Somogy counties. An Appendix to v. Hauer's Report (see p. 71).

Boehm, G. Beiträge zur geognostischen Kenntniss der Hilsmulde. [Geology of the Hils Trough.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 215–251.

Notices the Flammenmergel, the subhercynian Quader; the Speeton, Hils clay and Elligser Brink beds, these last being Neocomian; the Purbeck marls, Asphalt limestone of Holzen, beds of Portland and Kimmeridge age; lists of fossils are given in each case. The sandstone of the Hils basin belongs not to the Neocomian, but to the Gault. The Elligser Brink beds are supposed in part to be marine equivalents of the Weald; so is the Hils conglomerate. The new specific names are *Serpula hilsensis, Panopæa punctato-plicata,* from Neocomian. E. B. T.

Boutillier, Louis. Rapport géologique sur l'excursion faite à Amiens le 11 juin 1876 par la Société des Amis des Sciences naturelles de Rouen. [Excursion to Amiens.] *Bull. Soc. Sci. Nat. Rouen,* sér. 2, ann. 12, pp. 173–178.

Describes the St. Acheul Quaternary deposits and the Chalk on the right bank of the Somme.

——. Notice sur un dépôt alluvial de Saint-Aubin-sur-Mer (Calvados) contenant des Nummulites. [Alluvial Deposit containing Nummulites.] *Bull. Soc. Sci. Nat. Rouen,* sér. 2, ann. 12, pp. 183–185, figure in text.

The Nummulites, apparently derived from Tertiary beds, occur, with shell-débris of recent species, in a thin layer capping the Great Oolite cliff at the point of the coast mentioned. G. A. L.

Bouvart, —. Sur la géologie des environs de Rethel. [Geology of the

Neighbourhood of Rethel.] *Ann. Soc. Géol. Nord*, t. iv. pp. 33–36. Discussion by **Dr. C. Barrois**, pp. 36, 37.

Notices some Alluvial and Drift deposits, and mentions a chalk quarry, recognized by Dr. Barrois as in the zone of *Micraster breviporus*.

Boxberg, Ida von. Ueber Niederlassungen aus der Renthierzeit im Mayenne-Département. [Colony of the Reindeer Age in the Mayenne.] *Sitz. Isis Dresden*, pp. 1–5.

Gives a section of cave-deposits, and notes on bones, implements, &c., from the Margot, Rochefort, and Goat Caves.

Branco, W. Notiz über das Vorkommen des Muschelkalkes bei Altmersleben in der Altmark. [Occurrence of Muschelkalk at Altmersleben.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 511–514.

At Altmersleben near Calbe the Muschelkalk is seen in 3 quarries; the fossils show that the limestone is U. Muschelkalk. That the lower Anhydrite group occurs in the neighbourhood is shown by borings, which went through gypsum and then salt from 196 to 373 metres, and did not reach its base. E. B. T.

——. [Luxemburg Oolites.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 841–843.

The Lias corresponds fairly with the Swabian; the *Torulosus*-bed is wide-spread. The ironstone beds are either *Murchisoniæ* zone or *T. navis* zone. E. B. T.

——. Die Vulkane des Herniker Landes bei Frosinone in Mittel-Italien. [Volcanoes of the Herniker District, near Frosinone, Central Italy.] *N. Jahrb.* Heft vi. pp. 561–589; coloured map and 2 woodcuts.

To the group of 6 volcanos, already known, adds 2 others and perhaps a ninth. Each is described in detail. Callame is the only one which shows a distinct crater. These volcanos are younger than the M. Tertiary strata, but older than certain alluvial deposits. Their activity seems to have ceased at the close of the Post-tertiary period, or soon afterwards. The Selva dei Mula has no lava, and the Tichiena has no tuff; but the other volcanos are built up of both lava and tuff. Part of the loose volcanic product may owe its stratification to the action of water, probably a lacustrine expansion of the River Sacco. All the lavas are true leucite and augite rocks; the Pofi lava also contains microscopic plagioclase. The constitution of these lavas closely connects them with the old lavas of Latium. F. W. R.

Breton, L. Étude sur le prolongement au sud de la zône houillère du Pas de Calais. [Southerly Prolongation of the Coal-Measures of the Pas de Calais.] *Ann. Soc. Géol. Nord*, t. iv. pp. 138–158, pls. i., ii. (sections), 4 woodcuts.

Begins with some theoretical considerations regarding the succession and disposition of the Palæozoic rocks in the Calais basin, and states the evidence from certain sinkings for the existence of an important fault. The contortions and faultings which have led to the separation of the basins of Dinant and Namur are shown by diagrams. Describes the southern limit of the Coal Measures at Auchy-au-Bois, where they underlie older beds, the whole series being reversed and cut in two by a fault. Gives an account of the sinkings which proved this to be the case, and led to the discovery of the underlying Coal Measures. Draws attention to fossils indicating the presence of the zone de Tournai (part of the Carb. Limestone) in one of the borings, and discusses the age of the Auchy-au-Bois Coal Measures, noticing the absence of Sigillariæ and Lepidodendrons among the fossils from the pits. A. J. J-B.

Burgerstein, Dr. L. Beitrag zur Kenntniss des jungtertiären Süsswasser-Depots bei Ueskueb. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. pp. 243–250, tab. 3.

The age of the beds noticed cannot be defined further than that they belong to the freshwater beds which in E. Europe were prevalent about the U. Miocene and Pliocene times. Ueskueb is on the R. Vardar in Macedonia. Described as new species are *Prososthenia Suessii*, *P. crassa*, *P. nodosa*, *P. reticulata*, *Neritina Neumayeri*, *Melania macedonica*. E. B. T.

Calderon y Araña, Salvador. Caverna de Oreña (Santander). [Cavern of Oreña.] *Bol. Inst. Lib. Enseñ.* An. 1, no. 2, p. 6.

This cavern has been inhabited by men intermediate between the Kitchen-midden men and the Cave-men. Remains of deer, antelope, and water-rat occur. J. F.

Calderon y Araña, Salvador, and **F. Quiroga y Rodriguez.** Erupcion ofitica del ayuntamiento de Molledo (Santander). [Ophitic Eruption in Santander.] *Ann. Soc. Españ. Hist. Nat.* t. vi. pp. 24, pl.

Capellini, Prof. G. Sulle marne glauconifere dei dintorni di Bologna. [Glauconite-marls of Bologna.] *Boll. R. Com. geol. Ital.* viii. pp. 398–406, and *Rend. Ac. Sci. Ist. Bologna.*

Carstens, C. D. Die älteren Meeresablagerungen am Jadebusen. [L. Marine Beds of Jadebus.] *Sitz. Isis Dresden,* for 1876, pp. 101, 102.

Chauselle, —. Houilles de Dombrowa (Pologne russe). [Polish Coals.] *Comp. Rend. Soc. Industr. min. St. Etienne,* December, p. 3.

Chellonneix, E. Note sur la position du *Belemnites plenus* au Cap Blanc-Nez. [Position of *B. plenus* at Cape Blanc-Nez.] *Ann. Soc. Géol. Nord,* t. iv. pp. 205–208.

Notes the difference between Dr. Barrois and Prof. Hébert regarding this horizon, the former considering it part of the Cenomanian, the latter taking it as the base of the Turonian. Describes the appearances presented by the junction-beds at Cape Blanc-Nez, and finds that the Belemnite is confined to a zone below the line usually taken as the limit of the Cenomanian. Agrees, therefore, with Dr. Barrois, but notices that broken and remaniés fragments of the Belemnite sometimes occur at the base of the Turonian. A. J. J-B.

Coppi, Francesco. Nota sul Calcare a *Lucina pomum* Dod. [*L. pomum* limestone.] *Boll. R. Com. geol. Ital.* viii. pp. 69–71, woodcut.

Believes that this limestone is Miocene, and not Pliocene, where it was classed by Manzoni (see Geological Record for 1876, p. 92). A section at Montebaranzone is given. E. B. T.

Coquand, Prof. H. Note sur la Craie supérieure de la Crimée et de l'Aquitaine, des Pyrénées et de l'Algérie. [U. Chalk of the Crimea, and its Synchronism with the Campanian Stage of Aquitaine, &c.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 86–99, woodcut.

Gives full lists of fossils to support this proposition, as well as a *résumé* of Prandel's memoir on the Cretaceous and Nummulitic formations of the Crimea. G. A. L.

Corneliussen, O. A. Nœverhaugens jernglansforekomster. [Deposits of Hematite at Nœverhaugen, in Norway.] *Nyt Mag. Nat.* Bd. 22, pp. 378–398, 2 woodcuts, 1 geological map.

A geological and physical description of the iron-ore deposits discovered in 1874 not far from Bodö. The ore occurs in and between layers of mica-schist and granular limestone of primitive age. Holds that the ore does not occur as layers, but owes its origin to plutonic forces, perhaps a process of sublimation—an opinion contrary to that of Gumælius (see Geological Record for 1875, p. 389). E. E.

Cortazar, Daniel de. Descripcion física, geológica y agrológica de la Provincia de Valladolid. [Geology, &c. of Valladolid.] *Mem. Com. map. geol. Españ.* pp. 212, 4 pls. (2 of fossils, view, and geological map).

Part 1. Orography, Hydrography (Springs, Mineral-waters, Well-waters, etc., pp. 47–81, with analyses); Earthquakes, p. 90.

Part 2. Geology, pp. 95-147. The physical features of the province are wide table-lands of nearly uniform height, divided by valleys of nearly uniform depth. Horizontal freshwater Tertiary rocks cover two thirds of the district, which wholly consists of these and Quaternary beds. The Tertiary beds are divisible into three formations. In the highest of these (chiefly calcareous), fossils are fairly abundant in the limestone, and of U. Miocene character. The central (marls, clays, and gypsum) is about 80 metres thick. The sandy deposits of the lowest (Eocene) are at least 100 metres thick. The districts occupied by all those beds formed part of the great lakes that existed in the Tertiary epoch. Diluvial beds cover wide tracts, especially in the north, but are of no great thickness. Besides shells of land and freshwater Mollusca, remains of birds' eggs and teeth of *Mastodon* have been found in the Tertiary beds. A comparison with the beds of the Paris Basin shows a considerable resemblance.

Part 3. Agriculture (Mineral Manures, Origin of Soils).

The Map, on a scale of 1 : 400,000, shows Post-Pliocene (3 divisions) and Tertiaries (3 divisions). J. F.

Cossigny, — de. Note rectificative sur le terrain crétacé inférieur du département du Cher. [Correction with regard to the L. Cretaceous of the Cher.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 321–323.

Credner, Prof. Hermann. Ueber ein neues Vorkommen des Alunites. [New Occurrence of Alunite.] *Sitz. naturf. Ges. Leipzig*, Jahrg. 4, pp. 21, 22.

In sand under L. Oligocene brown coal, the Mulde-Thale, E. of Leipzig.

Curioni, Giulio. Geologia. Parte prima. Geologia applicata delle Provincie Lombarde. Parte seconda. Descrizione Ragionata delle Sostanze Estrattive Utile Metalliche e Terree raccolte nelle Provincie Lombarde. [Geology of Lombardy.] 2 vols. Pp. 418 and 294, and geological map of Lombardy folded in 4to case. 8vo. *Milan.* Price 24*s.*

Vol. i. gives full petrological, stratigraphical, and palæontological details of the rocks of the province, viz. gneiss and mica-schist, amphibolitic gneiss, chlorite- and talc-schists, Carboniferous (4 divisions), Permian (2 divisions), Trias (8 divisions), Infralias (3 divisions), L. and U. Lias, Oxfordian, Neocomian, Cretaceous (3 divisions), Eocene, Miocene, Pliocene (3 divisions), Postpliocene (3 divisions), and Recent deposits, also granite, syenite, diorite, porphyry, and serpentine. The minerals, &c. of commercial value are described in vol. ii., with many analyses; they comprise agates, &c., tripoli, sulphur, arsenic, barytes, limestones, marbles, gypsum, fluorspar, manganese, iron, nickel, zinc, mercury, lead, copper and gold ores, kaolin, anthracite, lignite, peat, petroleum, bitumen, and building materials, besides other minerals and ores of the rarer metals occurring in unimportant amount. W. H. D.

Dakyns, J. R. High Level Terraces in Norway. *Geol. Mag.* dec. ii. vol. iv. pp. 72–75.

Describes terraces up to 2100 feet above the sea in the Dovrefjeld.

Dathe, E. [Geology of Saxony.] *N. Jahrb.* Heft ii. pp. 163–166.

Describes a survey of the N. edge of the Saxon granulite district, especially around Hartha and Döbeln. The Döbeln gneiss is a sericite rock; and the surrounding slates also contain sericite; they belong, not, as Naumann supposed, to the mica-slate, but to the phyllite formation. The crystalline rocks are overlain by Drift with pebbles of southern origin. The probable source is discussed. F. W. R.

Debombourg, —. Notice sur la mine de plomb argentifère d'Ancy (1495 à 1512). [Argentiferous Galena Mine of Ancy (A.D. 1495–1512).] *Ann. Mines*, sér. vii. t. xii. pp. 66–80.

An antiquarian paper.

Debray, H. Sur un squelette humain trouvé dans la Tourbe à Aveluy (Somme). [Human Skeleton from the Peat at Aveluy.] *Ann. Soc. Géol. Nord*, t. iv. pp. 15–17.

Notices the discovery of a skeleton at a depth of 17½ feet under alluvium, and thinks there is reason to refer it to the Neolithic age.

Debray, H. Note sur une médaille romaine trouvée dans la Tourbe à Aire (Pas-de-Calais). [Roman Coin found in the Peat at Aire.] *Ann. Soc. Géol. Nord,* t. iv. pp. 122-125.]

The coin was found at a depth of nearly 16 feet; and a section is given of the sinking in which it occurred.

Delage, —. Stratigraphie des terrains primaires dans le Nord du département d'Ille et Vilaine. [Primary Rocks, Department of Ille and Vilaine.] Pp. 138; 11 plates. 4to. *Rennes.*

Delatour, Albert. Note sur le Gault des environs de Brienne (Aube). [Gault near Brienne.] *Bull. Soc. Géol. France,* 3 sér., t. v. pp. 22-24.

Announces the discovery of the *Ammonites splendens* Zone in the neighbourhood of Brienne-Napoléon, in the Aube.

Descamps, A. Le Banc tourbeux des Meules. [Peat Bank, Lower Seine.] *Bull. Soc. Géol. Norm.* t. iii. pp. 64-70, plate (map and section).

This, the most important obstacle in the navigation of the Lower Seine, above Rouen, is on the N. bank, and was formed after the last decrease of the river (since Quaternary times). There are other like banks. W. W.

Desnoyers, Alf. Sur un gisement d'Éléphants et d'autre Mammifères fossiles découvert dans le Bassin de la Seine, au Nord de Paris. [Locality for Elephant and other Mammalian Remains in the Seine Basin, N. of Paris.] *Bull. Soc. Géol. France,* sér. 3, t. v. pp. 132-138; 1 figure.

The deposit consists of green clay, underlying other clays and gravels, lying in a little bay or combe of the gypsum hills N. of Paris. Remains of elephant, rhinoceros, horse, and deer have been found, of which details (by **A. Gaudry**) are appended. G. A. L.

Dittmarsch, A. Ein Vorkommen von gediegenem Silber in den Herrerias am Fusse der Sierra Almagrera in Spanien. [Silver in the Sierra Almagrera, Spain.] *Sitz. Isis Dresden* for 1876, pp. 106-111, pl. i.

Analysis by **Fritsch.**

Dollfus, G. Description et classification des dépôts tertiaires des environs de Dieppe. [Tertiary Beds of Dieppe.] *Ann. Soc. Géol. Nord,* t. iv. pp. 19-33; 1 woodcut.

Describes the sections of the Eocene at Dieppe, Gisors, and Newhaven, and gives a table in which these are correlated with beds in the London Basin. Looks upon the London Clay as represented by the Sables de Cuise. A new species (*Cytheridea lignitarum*) from the lignites of Dieppe is described and figured. A. J. J-B.

Donayre, F. M. Datos por una reseña fisica y geológica de la region S.E. de la provincia de Almeria. [Geology, &c. of the S.E. of Almeria.] *Bol. Com. map. geol. Españ.* t. iv. pp. 385–461, pl. ii. (geological map), many woodcuts (sections).

Post-Tertiary eruptive rocks, principally trachytes and basalt, cover a considerable area in the S.E. They contain rich veins of lead-ore, slightly argentiferous, and of manganese, also much fine kaolin, little used, owing to the difficulty of carriage. The Cambrian or transition rocks are much altered, sometimes twisted, and contain no fossils; and it is often difficult to determine their dip. They contain dykes impregnated with iron to a sufficient extent to be worked. Pliocene rocks cover a large area of the district; they contain fossils, are sometimes raised by the igneous rock, are sometimes of great thickness, and contain masses of crystalline gypsum. The "Recent" beds are of little importance. Iron-ore, chiefly grey hæmatite (with sometimes from 10 to 15 per cent. of manganese and 47 of iron), is worked to a small extent, which might be much more, but for the cost of transport. Veins of argentiferous galena, of calamine, and of manganese are worked in several places. Sulphide of antimony is found. An analysis of the mineral waters is given. The map shows 4 divisions. J. F.

Dufour, Ed. Essai sur les terrains tertiaires de Campbon (Loire-Inférieure). [Tertiaries of Campbon.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 73–86; 2 woodcuts.

22 beds described, belonging to the Suessonian and Parisian (L. and U. Calcaire grossier) divisions of the Eocene. Lists of fossils given, and two sections from the Pancaud Quarries. G. A. L.

——. Description sommaire, avec plan, coupes, profil, et listes de fossiles, des terrains tertiaires, fluvio-lacustres et marins de Campbon à Saint-Gildas-des-Bois (Loire-Inférieure). [Tertiary Deposits between Campbon and Saint-Gildas-des-Bois.] Pp. 24; 8 plates. *Nantes.* [See above.]

Dumas, Ém. Statistique géologique, minéralogique, métallurgique et paléontologique du département du Gard. 3 partie. [Geology, Mineralogy, Metallurgy, and Palæontology of the Gard. Part 3.] *Paris* and *Nîmes.* Entered by mistake in the GEOLOGICAL RECORD for 1876, p. 60.

Ébray, Th. Stratigraphie de la Pointe d'Orchez. [Stratigraphy of Pointe d'Orchez.] *Bull. Soc. Géol. France*, 3 sér., t. v. pp. 39–48; 4 woodcuts in text.

Distinguishes the following divisions (in opposition to M. Favre):—1. Slips. 2. Alluvia. 3. Mollasse. 4. Gault and Urgonian. 5. Neocomian. 6. U. Oolite Limestones. 7. Dolomites. 8. Helminthoidal Limestones (regarded as Eocene by Favre). 9. Gt. Oolite. 10. Ferruginous Marls. 11. *Cancellophycus scoparius* Limestones. 12. Limestones with flints. 13. Lias. 14. Trias. G. A. L.

Ébray, Th. Sur des terrains du Bois de la Bâtie près Genève. [Deposits in La Bâtie Wood near Geneva.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 115–121: 6 figures.

Describes and discusses the origin of certain glacial gravels and muds.

——. Quelques réflexions sur le prétendu soulèvement du Sancerrois, et sur la note de M. de Cossigny. [On the Supposed Upheaval of the Sancerrois, and on M. de Cossigny's note.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 302–304.

Re-statement of opinions misunderstood by M. de Cossigny.

——. Rapports de la Faille du Salève avec la ligne anticlinale qui relie la Bavière, la Suisse et la Savoie. [Relations of the Salève Fault with the Bavarian, Swiss, and Savoyard Anticlinal.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 318–321.

——. Étude sur les Eaux minérales d'Évian (Haute-Savoie). [Mineral Springs of Évian, Upper Savoy.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 394–399; 2 woodcuts.

All these springs occur in an E. and W. line. This is parallel to the Lake of Geneva, "the direction of which is determined by the fault passing at the foot of the Meillerie rocks, to which fault the great depths of that region are due." G. A. L.

Engel, Dr. Theodor. Der "Weisse Jura" in Schwaben. [White Jura of Swabia.] *Jahresh. Ver. Nat. Württ.* Jahrg. 33, pp. 104–290.

Describes the series in detail, noting especially the palæontology, and giving a list of fossils (45 pp.).

Erdmann, E. Förkastningar i sand. [Faults in Sand.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 286–288; 2 woodcuts.

——. Iakttagelser rörande Krosstensgrus med glacierstenar. [Till, with striated stones.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 393–399.

Notes from the Askersund sheet of the Swedish Geological Survey map.

Evans, Dr. John. On the Earth Pyramids near Botzen in the Tyrol. *Trans. Watford Nat. Hist. Soc.* vol. i. part 7, *Proceedings*, pp. xliii, xliv.

Describes the pillars and the mode of their formation.

Faber, G. L. Fiume and her new Port. *Journ. Soc. Arts.* vol. xxv. no. 1304, p. 1040.

This part contains a notice of quarries, with analysis of limestone, p. 1041; and a geological section, p. 1043.

Fabre, G. Sur l'âge du soulèvement de la Margeride. [Age of the Margeride Upheaval.] *Compt. Rend.* t. lxxxiv. pp. 566–568.

The upheaval of the Margeride mountains (a granitic range running between Mauriac in Cantal to near Mende) is shown to be due to a post-Jurassic fault. The Jurassic sea (Infra-lias) covered the upper plateau of the range (Palais-du-Roi, 1350 metres high). G. A. L.

Fahlcrantz, A. E. Om Dannemora jernmalmsfält. [Iron-ore District at Dannemora, Sweden.] *Bihang K. Svenska Vet.-Akad. Handl.* Bd. 4, no. 2, pp. 1–15, 6 pls. (geol. map, plans and sections of mines).

Short geological and petrographical account of the different iron-layers, the surrounding rocks and the rocks which occur as dykes, with some notes on faults. E. E.

Faly, —. Sur l'existence d'une colline tertiaire à Masnuy St.-Jean. [Tertiary Hill at Masnuy St.-Jean (in Hainault).] *Ann. Soc. Géol. Belg.* t. iv. *Bull.* pp. lxxxix, xc.

Note of occurrence of a small outlier of U. Ypresian and Paniselian beds like those of Mont Panisel and the hill at Mons.

Favre, Prof. Ernest. Étude stratigraphique de la partie sud-ouest de la Crimée. [Geology of S. W. Crimea.] See **De Loriol** under INVERTEBRATE PALÆONTOLOGY.

Feistmantel, K. Zum Tribolitenfunde [Triboliten] bei Přibram (II). [Discovery of a Trilobite at Přibram.] *Verh. k.-k. geol. Reichs.* no. 2, p. 40.

Second note. See GEOLOGICAL RECORD for 1876, p. 64.

Feistmantel, —. Die Eisenstein in der Etage D des böhmischen Silurgebirges. [Bohemian Silurian Ironstone.] *Abh. k. böhm. Ges. Wiss.* F. 6, Bd. viii.

Feistmantel, Dr. O. Geological and Historical Notes on the Occurrence of a Fauna, chiefly of Permian affinities, associated with a Carboniferous Flora in Gas-coal in the Uppermost Portion of the Bohemian Coal-strata. *Geol. Mag.* dec. ii. vol. iv. pp. 105–120.

Describes the Pilsen and Kladno-Rakonitz coalfields, showing that there is no strict boundary between the true Carboniferous and the Permian, and reviews the literature of the subject. W. H. D.

Fennel, C. S. En præglacial flodbädd vid Bjuf i Skåne. [Præglacial River-bed at Bjuf in Skåne, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 339–341, woodcut.

Note of a wash 45 feet deep and 150 feet wide through sandstone and the upper coal-seam in the colliery at Bjuf, filled with sand, gravel, and boulder-clay. There are some remarks by **A. S. Nathorst.** E. E.

Fischer, P. Coquilles fossiles recueillies dans un banc argilo-sableux sur la plage d'Arcachon. [Fossil Shells from a Bed on the Shore at Arcachon.] *Proc.-verb. Soc. Linn. Bord.* vol. xxxi. pp. xxxiii, xxxiv.

27 species, all recent.

Forsyth-Major, C. J. Sul livello geologico del terreno in cui fu trovato il cosi detto Cranio dell' Olmo. [Geological Horizon of the Olmo Skull.] *Arch. Antrop. Etnol.* vol. vi. pp. 344, 355.

Fraas, Dr. O. [Older Stone Age in Swabia.] *Jahresh. Ver. Nat. Württ.* Jahrg. 33, pp. 45–51.

Notices the contents of a Cave-deposit.

Frassi, Giacomo. Notizie sulla Sorgente del Lambro. [Source of the Lambro.] *Atti Soc. Ital. Sci. Nat.* vol. xix. pp. 285–288.

Describes an intermittent spring, and two small caves, near the source of the Lambro.

Friis, T. Om Kisforekomsterne ved Röros. [The Iron and Copper-pyrites Deposits at Röros, Norway.] *Nyt Mag. Nat.* Bd. 22, pp. 321–353; 24 woodcuts.

An account of the probable connexion between the different mines in the district, and a discussion whether the ores are deposited as layers or as veins. E. E.

Frischauf, Prof. J. Die Sannthaler Alpen. [The Sannthal Alps.] Map (not geological) and a Panorama of the Grintouc. *Vienna.*

A handbook to tourists in this region, with special reference to Natural Science, including Geology.

Fuchs, Th. Geologische Uebersicht der jüngeren tertiärbildungen des Wiener Beckens und des ungarisch-steirischen Tieflandes. [Geology of the Vienna Basin.] *Zeitsch. deutsch. geol. Ges.* **xxix.** pp. 653–709.

Drawn up for the Vienna meeting of the German Association. A compendium of the Tertiaries of Vienna and Hungary, giving all subdivisions, lists of fossils characterizing each, table of foreign equivalents, literature, &c. E. B. T.

——. Die Pliocänbildungen von Zante und Corfu. [Pliocene of Corfu, &c.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Bd. lxxv. pp. 309–320, tab. 1, and 4 cuts.

Zante consists of Hippurite limestone, on which lies Pliocene, consisting of plastic marls below, and sands, conglomerate, and thick gypsum beds above, seen in Monte Scopo and on the S.W. coast, where the contortions and dislocations of the marl are noteworthy and depicted in the sections. Nummulites were noticed in loose blocks which seem to be younger Tertiary. Corfu also consists of Hippurite limestone and Pliocene. Lists of fossils are given from beds which seem analogous to the Baden and other divisions of the Vienna Basin. E. B. T.

——. Ueber die Natur der sarmatischen Stufe und derer Analoga in der Jetztzeit und in früheren geologischen Epochen. [The Sarmatian Stage and its Analogues.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Bd. lxxv. pp. 321–339.

Formations with facies analogous to the Sarmatian are reckoned to be the Zechstein, German Muschelkalk, Raibl beds of Alps, and Avicula contorta beds. They are marked by the absence or scarcity of corals, sponges, polyzoa, echinoderms, brachiopods, and cephalopods, and thick-shelled or ornamented lamellibranchs and gasteropods, whilst the deposits consist of thin sandstones and marls with platy limestones and shell-beds, or cavernous limestones and vesicular oolites, with absence of massive beds. From discussion of the genera which occur, it is shown that these beds have their analogues in deposits formed in secluded seas, where the water may be insufficiently aërated by currents, or rendered brackish, somewhat as in the Baltic, Black Sea, &c., where the fauna is local in distribution or impoverished: the parallel between genera living now in the Black Sea and those in the Sarmatian beds is complete. Continental conditions in Europe were predominant at the close of the Palæozoic period, and from the Miocene onward. The former corresponds with a set of beds in N. Europe, viz. Zechstein, salt formations, &c., with impoverished fauna, while this condition was intermittent and less marked in the Alpine area. In the second period, the half-brackish and stunted fauna was prevalent in E. Europe and eastwards, while a normal marine fauna held in the west.
E. B. T.

Fuchs, Th. Ueber die Natur des Flysches. [Nature of the Flysch.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Bd. lxxv. pp. 340–362.

Argues that it is not an ordinary mechanical sediment, but a produce of eruptive nature such as would be produced by mud-volcanoes. This is deduced from:—1. Its petrographic nature; it consists mostly of homogeneous marls, with absence of pure limestone or conglomerates, while frequently connected with it are petroleum-sources. 2. In Italy and E. Europe it is much connected with serpentine and gabbro, and seems to alternate with the former or form passages into it, as if in the relation of a tuff to it. 3. It contains angular exotic blocks of granite, &c., whose presence is explained if brought up from below; it is even thought possible to account in this way for the large detached limestone masses ("Block-Klippen") found imbedded in it in the Carpathian area. 4. The absence of fossils is deemed confirmatory. 5. Also the fact of its being local and of no one age, but of date between L. Cretaceous and Oligocene, while in an adjoining area perfectly normal beds of the same age as those with a Flysch facies will be present and full of fossils. E. B. T.

——. Ueber die Entstehung der Aptychenkalke. [Formation of the Aptychus Limestone.] *Anz. k. Ak. Wiss.* Jahrg. xiv. p. 168.

Fürnrohr, Dr. Ueber die geognostische Beschaffenheit des Regensburger Untergrundes. [Geology of Ratisbon.] *Corr.-Blatt. zool.-min. Ver. Regensburg*, Jahrg. 31, pp. 179–184, plate (sections).

The beds shown by the sections are Quaternary, Cretaceous (9 divisions), and Jurassic (dolomitic limestone).

Gascue, Francisco. Nota acerca del Grupo Numulitico de San Vicente de la Barquera en la Provincia de Santander. [Nummulitic group of San Vicente de la Barquera, Santander.] *Bol. Com. map. geol. Españ.* iv. pp. 63–88, pl. C, geol. map and 3 sections.

The Nummulitic rocks rest conformably on Cretaceous with a dip of about 40°. Below the Cretaceous are Carboniferous Limestone and Devonian. The coloured map shows 6 formations. J. F.

Gastaldi, Prof. B. Su alcuni fossili paleozoici delle Alpi marittime e dell' Apennino ligure, studiati da G. Michelotti. [Palæozoic Fossils, Alps and Apennines.] *Atti R. Ac. Linc.* ser. 3, *Mem.* vol. i. pp. 113–128, pls. i.–iv. (sections and fossils).

Three horizons of quartzite alternate with as many of limestone. An analysis by **Prof. Cossa** of a seam of anthracite, and a letter from **Michelotti** on some of the fossils, are given. W. H. D.

Ginth, Dr. H. E. [Petroleum in Roumania.] *Oesterreichische Monatschrift für den Orient.* Noticed in *Journ. Soc. Arts,* vol. xxvi. no. 1327, pp. 481, 482 (1878).

Large deposits of petroleum have been found in the Transylvanian Carpathians. Analyses are given of Moldavian and Wallachian petroleum. W. W.

Giorgi, C. de. Da Bari al Mare Ionio. [From Bari to the Ionian Sea.] *Boll. R. Com. geol. Ital.* viii. pp. 239–247; 2 woodcuts.

Notes on the neighbourhood of Bari and the Gulf of Taranto. The chief rocks noticed are Hippurite Limestone, Pliocene, and Gravels.

——. Appunti geologici da Pescara ad Aquila. [Geology of the Country between Pescara and Aquila.] *Boll. R. Com. geol. Ital.* viii. p. 382–391; woodcut.

Notes on the formations exposed on the railway through the Abruzzi and on the Gran Sasso, the highest point of the Apennines. The beds are included between the Ammonitiferous Limestone and the Mio-pliocene. E. B. T.

Godron, —. Du passage des eaux et des alluvions anciennes de la Moselle dans les bassins de la Meurthe en amont de Nancy et de la Meuse par la vallée d'Ingressin. [Hydrography and old Alluvia of the Moselle and Meuse.] *Mém. Ac. Stanislas,* sér. 4, t. ix.

Gombau, Isidro. Reseña fisico-geológia de la Provincia de Tarragona. [Physical Features and Geology of the province of Tarragona.] *Bol. Com. map. geol. Españ.* t. iv. pp. 181–250, pl. F (geol. map).

Part 1, pp. 181–200. Geography; Orography; Hydrography; Mineral waters, classified, but no analysis given; Meteorological observations; Agriculture.

Part 2, pp. 210–250. Geology. There are several masses of granite in the centre of the province, with copper ore and argentiferous galena; but neither are worked. There are also strips of porphyry, containing rich veins of lead- and copper-ores, among them the well-known lead mines of Falset, in porphyry in Silurian, worked for 4 centuries; but all are now nearly abandoned. Silurian rocks (micaceous clay-slate) occupy the central metalliferous zone; they are of no great thickness, and rest mostly on porphyry, much disturbed and folded, with many metalliferous veins of quartz penetrating to the porphyry below, without change of direction, but generally richer in the porphyry, and sometimes so bituminous as to burn. Triassic rocks (Keuper and Muschelkalk) cover a considerable extent. Gypsum, fine alabaster, saltsprings, beds of oxide of iron, manganese, and excellent building stone, limestone, and marble are found. Jurassic rocks cover a large area. Lists of Lias and Oolite fossils are given. An extensive bed of good lignite occurs, very thick, but is rendered useless from bad roads. Cretaceous rocks occur in the south; they are fossiliferous, and are quarried for marble. Tertiary rocks, both freshwater and marine, cover nearly half the province. In the N. is nummulitic limestone with gypsum and flints, and very fossiliferous. Miocene freshwater and marine deposits (list of fossils given). The Quaternary and Alluvial deposits, both freshwater and marine, are of no great importance. The delta of the Ebro has extensive peat-deposits and salt-works. A short account is given of the many rich mines (silver, lead, copper, iron, and manganese) now abandoned from want of enterprise, roads, capital, &c.

The map, on a scale of 1 : 600,000, is by **Alcibar**, dated 1866. Besides the 11 formations indicated by shading, it shows the position and product of the different mines, also the peat-deposits, salt-works, and heights. J. F.

Gosselet, Prof. Jules. Relations des sables d'Anvers avec les systèmes Diestien et Bolderien. [Relations of the Antwerp sands to the Diestian and Bolderian.] *Ann. Soc. Géol. Nord*, t. iv. pp. 1–14, section.

Refers to a previous suggestion, that the sands of Diest may correspond to the upper part of the sands of Antwerp (Caloo sands), and not to the lower part, or Edeghem sands, as has been supposed. Describes a section through the Bolderberg confirming this supposition, and gives the following classification of the Belgian Pliocene beds:—

Scaldisian system of Dumont.
3. Sands of Caloo with *Fusus antiquus* = Diestian.
2. Sands with *Isocardia cor*.
1. Sands of Edeghem with *Panopæa Menardi* = Bolderian.

A supplemental note draws attention to a memoir by M. Vanden Broeck on the Antwerp sands, stating the points of agreement or difference. A. J. J-B.

——. [Coupe d'un Sondage fait à la filature de Bousies.] *Ann. Soc. Géol. Nord*, t. iv. pp. 17–19.

An account of a well-section, 83 metres deep, through loam, sand,

clay with flints, bottom part of the Chalk, Dièves, green sands with *Pecten asper*, and Meule de Bracquegnies, to Carboniferous Limestone.
W. W.

Gosselet, Prof. J. Aperçu sur la constitution géologique de la Forêt de Mormal. [Geology of the Forest of Mormal.] *Ann. Soc. Géol. Nord*, t. iv. pp. 125–130.

Corrects some errors of former observers, and points out that the soil of the forest is formed by diluvial clay, from 20 to 30 feet thick, and often variegated in colour. Below this there is generally Tertiary sand or sandstone; but in some of the valleys tributary to the Sambre several members of the U. Cretaceous are met with. A. J. J-B.

——. Quelques réflexions sur la structure et l'âge du terrain houiller du nord de la France. [Structure and Age of the Coal Measures of N. France.] *Ann. Soc. Géol. Nord*, t. iv. pp. 159–179.

Makes some remarks on the memoirs of M. Breton and Abbé Boulay, especially noting their results with regard to the distribution of vegetable remains in the Coal Measures. It seems possible to divide these measures into palæontological zones; and M. Boulay recognizes four such, giving lists of their characteristic plants. M. Douvillé's opinion, that there are two distinct groups or stages in these measures, is also noticed; and there are some remarks on the physical conditions of the period. A. J. J-B.

——. La Marne de la Porquerie (Éocène inférieur). [The Porquerie Marl, L. Eocene.] *Ann. Soc. Géol. Nord*, t. iv. pp. 179–185.

A particular bed of marl in the valley of the Sambre, referred by M. Menzy to the Cretaceous system, really belongs to the L. Eocene; and several well-sections, in which it was found to overlie clay with flints, are noticed. A. J. J-B.

——. [Notes on a Flood in the Aisne; and of a sinking for Coal at Crespin.] *Ann. Soc. Géol. Nord*, t. iv. pp. 209, 210.

——. Compte-rendu de l'Excursion dans les Ardennes. [Excursion into Ardennes.] *Ann. Soc. Géol. Nord*, t. iv. pp. 210–231.

Ascending the valley of the Meuse, from Namur, the several divisions of the Carboniferous and Devonian rocks indicated by Dupont were recognized, as follows:—Black limestone with *Productus giganteus*; White limestone with *P. Cora*; Dolomite with *Encrinites* and geodes; Encrinitic limestone with *Cyathophyllum*; Psammitic schists; Psammites of Condroz: Limestone with *Spirifer Verneuilii*; Schists with *Favosites cervicornis*; Limestone with *Stringocephalus* and *Murchisoniæ*. In the Dinant basin, L. Devonian beds were seen resting unconformably on Silurian. A good section of the Devonian series was visited on the right bank of the river near Taillefer. At Charleville the following zones in the Lias were distinguished:—Aiglemont sandstone with

Amm. angulatus; Marls of Charleville, with *Ostrea arcuata*; Calcareous sandstone of St. Laurent; Marls with concretions and *Ostrea cymbium*; Ferruginous limestone; Marls of Flize with *Bel. tripartitus*. A. J. J-B.

Gosselet, Prof. J. Le calcaire dévonien supérieur dans le N.E. de l'arrondissement d'Avesnes. [U. Devonian Limestone in the N.E. of Avesnes.] *Ann. Soc. Géol. Nord*, t. iv. pp. 238–272, pl. iii. figs. 1, 2, and woodcut section.

The Devonian limestones of this district, originally viewed as forming one mass, are really divisible into two—the one characterized by *Stringocephalus Burtini*, the other by *Spirifer Verneuilii*. Describes the sections of the latter limestone near Ferrières, Cerfontaine, Ostergnies, Marpent, Rocq, Hestrud, Consolre, Beaumont, Boussignies, and Hurtebise; and concludes from the stratigraphical and palæontological evidence that the beds seen near these places form parts of one mass belonging to the U. Devonian. The identity of these limestones with those of Ferques and Frasne is brought out in a table comparing the faunas; and notes on the more remarkable fossils are added, *Rhynchonella boloniensis* (allied to *Rh. pleurodon*) and *Trachypora marmorea* being described as new. A. J. J-B.

——. Exposé de la constitution géologique des environs de Douai. [Geology of the Neighbourhood of Douai.] *Ann. Soc. Géol. Nord*, t. iv. pp. 283–291.

If a shaft were sunk near Douai, it would pass through clay or brick-earth, 13–16 feet; Sands with *Cyprina Morrisii*, 10 feet; and Cretaceous beds (Chalk, &c.), 514 feet. A table is given showing the succession of these beds in the wells at Roncourt and Guesnain. Below the Chalk, Carboniferous and Devonian beds are usually found; but at Roncourt they passed through a conglomerate, which may belong to the Trias, resting on Coal Measures and containing fragments of the older rocks. A. J. J-B.

——. Quelques documents pour l'étude des Schistes de Famenne. [Schists of Famenne.] *Ann. Soc. Géol. Nord*, t. iv. pp. 303–320; pls. iii. and iv. (fossils).

These schists are intermediate between the schists of Matagne and the psammites of Condros, into both of which they pass. The main object is to point out the existence of two distinct palæontological horizons, the first well exposed in the railway-cutting near the village of Seuzeilles, the second near Marienbourg, Romerée, and other places. Lists of the fossils are given; and the following are described and figured as new:—*Spirigera reticulata*, *Rhynchonella triæqualis*, *R. Omaliusii*, *R. Dumontii*, *Camarophoria crenulata*, and *Orthis pseudo-elegans*. A. J. J-B.

——. Les calcaires dévoniens supérieurs du nord de la France. [U. Devonian Limestones of N. France.] *Compt. Rend.* t. lxxxv. pp. 454, 455.

Concludes, on palæontological grounds, that the Avesnes limestone is intermediate between those of Ferques and Frasnes.

Groddeck, A. v. Beiträge zur Geognosie des Oberharzes. [Hartz Geology.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. Heft 3, pp. 429–447.

1. Treats of the beds in the Upper Hartz between the Diabase band and Bruchberg; they are without fossils here, but from the nature of the conglomerates and beds which have been termed "adinole," &c. they are referred to the Culm. 2. On a new vein in Upper Hartz, belonging to the system which radiates from the Upper Kellwasser valley. E. B. T.

Gröger, F. Der Bergbau zu Mies und die Gangablenkungen. [The Mies Mines and the Deviations of the Vein.] *Verh. k.-k. geol. Reichs.* no. 2, pp. 38–40.

Gruner, L. Sur la division des terrains houillers en étages basée sur les Plantes fossiles (d'après M. Grand'Eury). [Division of the Coal Measures by means of Fossil Plants.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 214–223.

A résumé and critique of the second part of Grand'Eury's 'Flore carbonifère du département de la Loire et du centre de la France,' especially as regards the stratigraphical conclusions. G. A. L.

Gümbel, Dr. C. W. Vorläufige Mittheilung über das Vorkommen der Flora von Fünfkirchen im sog. Grödener Sandstein Südtyrols (Ullmaniensandstein). [Occurrence of the Fünfkirchen Flora in the so-called Grödener Sandstone of S. Tyrol.] *Verh. k.-k. geol. Reichs.* no. 1, pp. 23–26, woodcut.

The section between Mazzon and Neumarkt is thus given, in descending order:—1. Seiss Beds; 2. Thick oolitic and dolomitic yellow limestone with disseminated malachite; 3. Ordinary Grödener Sandstone; 4. Plant bed; 5. Grödener Sandstone, usual type; 6. Plant bed; 7. Common Grödener Sandstone. The plants are similar to those at Fünfkirchen, regarded as Post-carboniferous (U. Permian) by Heer. G. A. L.

——. [Plant-beds of Neumarkt, Tyrol.] *N. Jahrb.* Heft viii. pp. 805, 806.

The discovery of the plant-bearing beds near Neumarkt, in S. Tyrol, was made by the writer, who also determined their stratigraphical position, and placed them with the *Bellerophon*-limestone. Stache has referred this limestone to the Zechstein. F. W. R.

Gumælius, O. Om jernmalmslagret vid Næverhougen i Norge. No. 2. [Iron-ore deposit of Næverhougen, Norway, No. 2.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 322–335.

An answer to a paper by **Corneliussen** (see p. 58). Discusses whether the ore occurs as an eruptive mass or as a layer. See also Geological Record for 1875, p. 389. E. E.

Gutzwiller, A. Geologische Beschreibung des Kantons St. Gallen und seiner Umgebungen. I. Mollasse und jüngere Ablagerungen. [Mollasse and Later Beds of St. Gall.] *Mat. Cart. géol. Suisse,* Livr. 14, pp. 1–152, pls. i., ii.

Halfar, A. Ueber die metamorphosirten Culmschichten in der nächsten Umgebung von Rohmker Halle, sowie über zwei neue, im nordwestlichen Oberharze beobachtete Culmkalk-Vorkommen. [On metamorphosed Culm-beds, &c., and on two new occurrences of Culm-limestone in the Hartz.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 63–76; 3 woodcuts.

The position of Culm-beds between U. Devonian, &c. in the Okerthal is explained by a reversed anticlinal. Analyses of the altered beds given. The presence of unaltered Culm-limestone is shown in the Okerthal by the discovery of characteristic fossils at two new spots. E. B. T.

Harpe, Dr. Phil. de la. Note sur la Géologie des Environs de Louèche-les-Bains. [Geology of Louèche.] *Bull. Soc. Vaud. Sci. Nat.* sér. 2, vol. xv. pp. 17–48, pls. i.–iii. (sections).

The Torrenthorn consists of crystalline rocks, Trias and Lias, with Drift and recent tuffs (from thermal springs). The Balmhorn shows Lias, M. and U. Jurassic, Neocomian, Cretaceous, and ? Nummulitic. A letter from **P. de Loriol** on the Valangian Echinodermata of the Daubensee is given. W. H. D.

Harting, —. De geologische en physische gesteldheid van den Zuiderzee-boden in verband met de voorgenomen droogmaking. [Geology, &c. of the Beds of the Zuiderzee.] *Versl. Med. Kon. Ak. Wet.* Raekke 2, Deel xi.

Hauer, Fr. Ritter von. Jahresbericht des Directors. [Annual Report of the Director of the Austrian Geological Institute.] *Verh. k.-k. geol. Reichs.* no. 1, pp. 1–11.

Account of the surveys conducted, publications issued, and generally of the work done in connexion with and outside the Institute, with regard to the geology of Austria and the adjoining countries. G. A. L.

Hebenstreit, Carl. Beiträge zur Kenntniss der Urgesteine des nordöstlichen Schwarzwaldes. [Older Rocks of N.E. Black Forest.] *Würzburg.*

Hébert, Prof. Edm. La Craie de la Crimée comparée à celle de Meudon et à celle de l'Aquitaine. [Chalk of the Crimea compared with that of Meudon and Aquitaine.] *Bull. Soc. Géol. France,* 3 sér. t. v. pp. 99–102.

A criticism of Coquand (see p. 58). Maintains that the U. Chalk of Aquitaine is an abnormally fine development of the Villedieu Chalk.

Hébert, Prof. E. Observations sur les terrains tertiaires du Piémont. [Piedmontese Tertiaries.] *Bull. Soc. Géol. France,* 3 sér. t. v. pp. 305–308.

A critique of Ch. Mayer's work on this subject, especially as regards the relation of Cadibona lignites to the marine beds of Bormida, and the flora and fauna of the Bormidian. G. A. L.

——. Recherches sur les terrains tertiaires de la Hongrie et du Vicentin. [Researches in the Tertiaries of Hungary and Vicentin.] *Rev. Sci.* pp. 309–312. Translated in *Boll. R. Com. geol. Ital.* viii. pp. 350–358.

Indicates the succession of the Tertiary beds in Hungary. Compares them with those of the Paris basin and of Vicentin, giving the results in a table. The basement-beds of the Hungarian series are wanting in the Paris basin, but correspond to the Monte Bolca and Monte Spilecco beds of the Vicentin. The overlying Nummulitic series (beds 2, 3, 4, 5) are correlated with the rest of the Eocene. The sixth bed contains a different fauna, and is comparable with the Sables de Fontainebleau (Miocene) from the *Cyrena convexa* clays to the Calcaire de Beauce. In the Vicentin, the famous Ronca beds are correlated with the bed 4 of the Hungarian series, and with the Calcaire Grossier supérieur and the Sables de Beauchamp. The U. Eocene is represented by fossiliferous marls and limestones, and the L. Miocene by the Laverda Marls and the "Calcaire de Castel Gomberto." These are succeeded by still higher beds. A. J. J-B.

Hébert, Prof. E., and — **Munier-Chalmas.** Recherches sur les terrains tertiaires de l'Europe méridionale. [Tertiary Deposits of S. Europe.] *Compt. Rend.* t. lxxxv. pp. 122–128, 181–186, 259–265, 320–325.

Part I. On the Tertiaries of Hungary (in 6 divisions), (Bakony, Gran, Buda-Pesth), pp. 125, 181. Part II. On the Tertiaries of the Vicentin (in 9 divisions), pp. 259, 320. The Introduction, p. 122, and the Conclusion, p. 323, by **M. Hébert** alone. A table is given correlating the deposits of both regions with those of the Paris Basin. G. A. L.

Helmersen, G. von. Bericht über die in den Jahren 1872 bis 1876 in den Gouvernements Grodno und Curland ausgeführten geologischen Untersuchungen zur Kenntniss der dort vorkommenden mineralischen Brennstoffe. [Mineral Fuels in Grodno and Courland.] *Bull. Ac. Imp. Sci. St. Pétersb.* t. xxiii. pp. 177–249.

Description of sections (sometimes with woodcuts) and boreholes in:—1. Quaternary Lignite of Grodno, with analyses by **Kulibin**; 2. Diluvial Lignite of the Courland coast, with sketch maps; 3. S. Courland; 4. Courland Peat-moors (inland), with analyses by **Kulibin** and **G. Thomas**; 5. Courland Amber. The extent of the deposits, the nature of the vegetation constituting the peat, &c., the conditions of origin, and in some cases the underlying rocks, are referred to. W. H. D.

Herbich, Dr. Franz. Die Geologie des Szeklerlandes. *Verh. k.-k. geol. Reichs.* no. 9, p. 158.

Abstract report by **B. v. Inkey** of a paper read to the Hungarian Geological Society.

Herrera, Alberto. Datos Geológico-Mineros de la provincia de Jaen. [Geology and Mines of the Province of Jaen.] *Bol. Com. map. geol. Españ.* t. iv. pp. 173–179.

Jaen is in Andalusia. There are Triassic, Liassic, and Silurian rocks and granite, a great abundance of excellent gypsum, lignite, and salt springs, also galena, copper, and antimony; but the mines are little worked. J. F.

Herter, Paul. [Tin-ore from Campiglia.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 194–196.

In working iron-ore (limonite) in "stocks" in limestone near Campiglia, tin-ore was discovered, first as loose blocks, but afterwards in place; it passes into limonite without any definite boundary. It had been worked by the ancients, but its existence long forgotten. E. B. T.

Hilber, Dr. V. Die Miocänschichten von Gamlitz bei Ehrenhausen in Steiermark. [Miocene of Gamlitz, Styria.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. pp. 251–270; map. Abstract in *Verh k.-k. geol. Reichs.* no. 10, pp. 166, 167.

The Miocene beds at Labitschberg are worked for lignite. A boring 34 metres below the coal did not yield fossils sufficient to correlate beds. Other exposures in the neighbourhood show Leitha limestone, which is a variable bed in the marl, together with other divisions of the Miocene. A table of fossils by horizons is given. E. B. T.

Hilgendorf, F. Neue Forschungen in Steinheim. [New Investigations at Steinheim.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 448–456.

Answer to **Prof. Sandberger** (see GEOLOGICAL RECORD for 1875, p. 96). Revisited Steinheim and had excavations made which confirmed his previous statements that the different varieties of *Planorbis* characterize different levels. E. B. T.

Hoernes, Dr. R. Fundorte von Versteinerungen des mittleren und oberen Jura in der Umgebung von Belluno, Feltre und Agordo. [Localities for M. and U. Jurassic Fossils in the neighbourhood of Belluno, Feltre, and Agordo.] *Verh. k.-k. geol. Reichs.* no. 7, pp. 110–114. Translated in *Boll. Com. geol. Ital.* viii. pp. 197–200.

2 M. Jurassic (*Stephanoceras Humphriesianum* zone) and 17 U. Jurassic localities are noted, with lists of fossils.

[illegible] Dr. [illegible] [illegible] Tertiär-ablagerungen [illegible] Verh. k.-k. geol. [illegible] pp. [illegible] vii. pp. [illegible]

[illegible] the north-[illegible] the green sand-[illegible] the yellow sandstone of [illegible].

[illegible] Leithakalk stage in Val [illegible]

[illegible] A. L.

[illegible] Dr. K. [illegible] Hungary in 1876. [illegible]

[illegible] details of geological work [illegible] and Styria.

[illegible] L. [illegible] of [illegible], med [illegible] with [illegible] woodcuts and 2 maps. [illegible]

[illegible] processes now showing [illegible] their composition, [illegible] IV. The [illegible] of Sweden. VI. [illegible] small geological map of Central and [illegible] E. F.

[illegible] [illegible] (No. 1.) [illegible] pp. 26. [illegible]

Analyses of [illegible] sand, and of [illegible] by V. Öberg, H. Santesson, A. [illegible] and A. Lindström, are given. [illegible] species of Diatomaceae have been found according to Prof. P. T. Cleve and Dr. Lagerstedt. See notice post. under Mars [illegible]. E. E.

——. [illegible] (No. 2.) [Description of the [illegible] Sheet.] [illegible] pp. 17. 8vo. *[illegible]*

Analyses of glacial clay and of peat from [illegible] localities, by A. Lindström and H. Santesson, are given. See notice post. under Mars *[illegible]*. E. E.

——. *Beskrifning till kartbladet* Vexiö. (No. 3.) [Description of the Vexiö Sheet.] Pp. 31; plate (rock-sections). 8vo. *Stockholm.*

Analyses of "Hälleflintschist," glacial clay, postglacial clay, and peat, by **H. Santesson,** are given. See notice *post,* under MAPS (Sweden).

Hummel, D. Beskrifning till kartbladet Båstad. (No. 60.) [Description of Båstad Sheet.] *Sveriges Geol. Undersökn.* pp. 35; plate (map and section). 8vo. *Stockholm.*

Analyses of diabase, diluvial sand, glacial clay, postglacial clay, and marine alluvial clay are given. See notice *post,* under MAPS (Sweden).

Inostranzeff, A. Geologische Skizze des Provenetzischen Bezirks im Olonetzer Gouvernement und seine Erzlagerstätten. [Geological Sketch of the Provenetz District in the Government of Olonetz and of its Ore-deposits.] *St. Petersburg.*

Issel, A. Osservationi geologiche sul Monte Negro. [Geology of Monte Negro.] *Rome.*

Jaunel, —. Lettre . . . . sur les couches fossilifères de Vireux. [Fossiliferous Beds of Vireux.] *Ann. Soc. Géol. Nord,* t. iv. pp. 235–238.

Gives the succession of the Devonian beds near Vireux, whence a small collection of fossils was got, the most important among them being good specimens of *Pleurodictyum problematicum.* The paper is preceded by remarks by **Prof. Gosselet** on the discovery and on the general structure of Ardenne, pp. 232–235. A. J. J-B.

Jentzsch, Dr. A. Das Relief der Provinz Preussen. Begleitworte zur Höhenschichtenkarte. [Orography of Prussia. Explanation of the Prussian Contour Map.] *Königsberg.*

To some extent geological.

——. Beiträge zur Kenntniss der Bernsteinformation. [Amber-deposits.] *Königsberg.*

——. Bericht über die geologische Durchforschung der Provinz Preussen im Jahre 1876. [Report of the Geological Survey of Prussia for the year 1876.] *Königsberg.*

Johnstrup, Fr. Om de i Aaret 1875 forefaldne vulkanske Udbrud paa Island tilligemed nogle indledende geografiske Bemærkninger. [Volcanic Eruptions in Iceland in 1875.] *Det Danske Geografiske Selskabs Tidskrift,* Bd. i. pp. 50–66; woodcut and 2 pls. (map, not geological, and views of craters at Askia).

Gives a historical review of the knowledge of Iceland in previous times, especially relating to the mapping of the country; an account of the situation of the volcanoes; and a description of the eruptions and their geology, with notes on the lavas and ashes accumulated. E. E.

Johnstrup, F. Indberetning om den i Sommeren 1876 foretagne Undersögelsesreise paa Island. [Report of the Exploration in Iceland in 1876.] *Tillæg til Rigsdagstidenden* for 1876–77. *Kjöbenhavn.* Pp. 14; 4 pls. (views and maps).

——. Jordskred ved Löngstrup. [Earth-slip.] *Illustreret Tidende,* No. 939. *Kjöbenhavn.* [Illustrated Paper.]

Julien, A. Sur l'existence de filons de bitume dans le granite des environs de Clermont-Ferrand. [Veins of Bitumen in Granite near Clermont-Ferrand.] *Compt. Rend.* t. lxxxiv. pp. 717, 718.

The origin of this bitumen is regarded as clearly mineral.

Karlsson, F. Beskrifning till kartbladet Clæstorp. (No. 62.) [Description of Clæstorp Sheet.] *Sveriges Geol. Undersökn.* pp. 41. 8vo. *Stockholm.*

By describing the "åsar" of the district their petrographic composition is explained. At 12 localities 200 stones have been collected, broken, and petrographically examined. Analyses of gneiss (2), "eurite" (6), Glacial clay, Postglacial clay, and of freshwater ooze (Swed. "Gyttja"), by **A. Hasselbom, H. Santesson,** and **A. Lindström,** are given. See notice *post,* under Maps (Sweden). E. E.

Karrer, Felix. Geologie der Franz Josefs Hochquellen-Wasserleitung. Eine Studie in der Tertiär-Bildungen am Westrande des alpinen Theiles der Niederung von Wien. [Geology of the Aqueduct along the W. margin of the Alpine Part of the Neighbourhood of Vienna.] *Abh. k.-k. geol. Reichs.* Bd. xi.—Also published separately. 4to. *Vienna.* Pp. xiii, 420; 20 pls. (including a geological map by **Fuchs**).

Bibliography, pp. 15–24. Detailed descriptions, with lists of fossils, &c., pp. 35–366. Descriptions of new *Mollusca,* by **Th. Fuchs,** pp. 367–370; of new *Foraminifera,* pp. 370–388. Conclusion, pp. 403–420. G. A. L.

Kaufmann, Fr. J. Kalkstein- und Schiefergebiete der Kantone Schwyz und Zug und des Bürgenstocks bei Stanz. [Limestone and Slate of Schwyz and Zug.] *Mat. Cart. géol. Suisse,* Livr. 14, pp. 153–342 (?), pls. iii.–vii. (?).

Kayser, E. *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 207, 208.

Mentions the occurrence in Rhenish L. Devonian of fossils hitherto only known in U. Silurian of Bohemia.

——. [Rhine Geology.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 407–412.

Announces the identification of Hercynian or Lowest Devonians in the Rhine district at Bicken, &c. Discusses the age of the Wissenbach shales, and places them very low in the L. Devonian, indeed as Hercynian. E. B. T.

Kayser, E. [On the Hercynian Beds.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 629, 630.

Recognized as equivalent to Barrande's beds F, G, H; they agree too with the U. Helderberg and Oriskany sandstone, which are classed as Devonian. Rather than consider them intermediate between the two formations, would assume them to be a deep sea facies of L. Devonian. Beds F–H in Bohemia should be removed from the Silurian. E. B. T.

Kober, —. [Cave in the Muschelkalk near Nagold.] *Jahresh. Ver. Nat. Württ.* Jahrg. 33, pp. 58–64.

Describes the cave, remarking on the chemical nature of the contents, and the geology of the neighbourhood.

Koch, Dr. G. A. Kurze Erläuterungen zur Vorlage der geologischen Aufnahmskarte des Silvrettagebietes. [Explanation of the Geological Survey Map of the Silvretta District.] *Verh. k.-k. geol. Reichs.* no. 8, pp. 137–142.

Summary of the geology of this region, which lies at the junction of Switzerland, the Vorarlberg, and the Tyrol.

——. Petrefakten vom Plateau der Sulzfluh. [Fossils from the Rhætic Alps.] *Verh. k.-k. geol. Reichs.* pp. 371–375.

——. Ueber die geognostischen Verhältnisse des Taunus. [Geology of the Taunus.] *Ber. Senckenb. nat. Ges.*

Köbrich, —. Das Bohrverfahren mit Wasserspülung im schwimmenden und festen Gebirge und seine Anwendung zu Purmallen bei Memel. [Boring at Purmallen, near Memel.] *Zeitsch. Berg-Hütt. Salinenw.* Bd. xxv. *Abhandlungen*, pp. 285–298, pl. xiv.

Describes the method followed in a boring for the discovery of the Coal Measures in Prussia. Drift, Alluvium, or Tertiary beds extended to 84·7 metres from surface; Jurassic limestones and sandy shales to 95 metres; Triassic and Permian sandstones to 226 metres; Zechstein dolomites, with sandy argillaceous alternations, giving strong springs of water, to 262 metres, and below this strong grey limestones at 276 to 289 metres; at the latter depth areas containing undoubted Devonian fossils were obtained. H. B.

Kosman, Dr. Die Braunkohlenbildung des Hohen Flemming und ihre Beziehung zu den Braunkohlen der Provinz Brandenburg. [The Lignitic Formation of the Hohen Flemming and its Relations to the Lignites of Brandenburg.] *Zeitschr. Berg- Hütt. Salinenw.* Bd. xxv. *Abhandlungen*, pp. 183–203.

Gives details of the succession and stratification of the Lignite-beds of the Flemming, a district on the Prussian and Saxon frontier near the Elbe at Wittenberg and the junction station of Jüterbogk. There are many references to and criticisms of the views of former writers.

The relation of the beds, which seem not to be well made out, owing to deficient evidence, point to a substantial synchronism with the similar formations of Lower Lusatia adjoining the district to the E. and Brandenburg to the N. The geological horizon is probably in the upper part of the M. Oligocene. H. B.

Lahusen, J. Ueber die jurassischen Bildungen im südwestlichen Theile des Gouvernements Rjäsan. [Jurassic Formations in the S.W. of the Government of Rjäsan.] *N. Jahrb.* Heft v. pp. 483-493.

Gives details of the stratigraphical and palæontological characters of the Jurassic strata of Rjäsan, in answer to Prof. Neumayr's paper on the *Ornatus*-clay of Tschulkowo. Maintains that the succession of the Russian Jurassic rocks is more perfect than Neumayr believes, but admits the difficulty of exactly correlating these strata with those of Europe. F. W. R.

Laube, Dr. G. C. Geologie des böhmischen Erzgebirges. I. Theil. [Geology of the Bohemian Erzgebirge. Part I.] *Arch. nat. Land. Böhm.* Bd. ii. Abth. 2, Heft iii.

The beginning of a complete geological monograph of the district, including a detailed account of the metalliferous deposits.

Lecureur, A. Résumé des Séances de la Société, Années 1875 et 1876. *Bull. Soc. Géol. Norm.* t. iii. pp. 9-38.

Letter on *Inoceramus*, p. 11. Fault of Villequier, p. 11. Kimmeridgian at Brindes, p. 12. Section in Havre Dock, p. 14. Geological history of Havre, particularly of the Floride shore, p. 16. *Cardiaster bicarinatus* and *Holaster latissimus*, p. 19. Marshes of the Lower Seine, p. 19. Gault at Cauville, p. 21. Zone of *Belemnites plenus* at Rouen, p. 26. Geological Exhibition of 1877, pp. 29, 30. W. W.

Lefèvre, Th. Excursions malacologiques à Valenciennes, Soissons, et Paris, Septembre 1876. [Malacological Excursions.] *Ann. Soc. Mal. Belg.* t. xi. pp. 14.

Notes on Museums, public and private, and on sections at Laversine, Cœuvres, and Vaubuin.

Lenz, Dr. O. Reisebericht aus Ostgalizien. [Report from E. Galicia.] *Verh. k.-k. geol. Reichs.* no. 11, pp. 187, 188.

Note of fieldwork in the summer of 1877.

Leymerie, Prof. A. Sur un nouveau gîte de mercure coulant, signalé dans la vallée supérieure de l'Hérault par M. de Quatrefages. [New Occurrence of Quicksilver in the Upper Hérault Valley.] *Compt. Rend.* t. lxxxiv. pp. 912, 913. (See also Supplement.)

Contains an extract from a letter describing finds of quicksilver by peasants among the roots of mulberry-trees, the subsoil being schistose. The occurrence of mercury lower down the valley (in limestone) was previously known. G. A. L.

Leymerie, Prof. A. Du phénomène ophitique dans les Pyrénées de la Haute-Garonne. [Ophites of the Pyrenees and Haute Garonne.] *Compt. Rend.* t. lxxxv. pp. 197–200.

The rocks grouped under the name "Ophite" are diorite and lherzolite; they occur on the lower flank of the range, not in the higher regions. Their age is variously estimated by geologists. The writer thinks that they may be referred (as to their principal manifestations at least) to the time of the great Pyrenean upheaval. G. A. L.

——. Les Pyrénées marquent la vraie ligne de séparation entre les étages éocène et miocène du terrain tertiaire. [The Pyrenees mark the true line between Eocene and Miocene.] *Compt. Rend.* t. lxxxv. pp. 384, 385.

Argues that the line between Miocene and Eocene is higher than usually admitted—namely, between the yellow and blue Fahluns, where there is marked unconformity. The blue Fahlun (=Fontainebleau grits) is the equivalent of the great unfossiliferous Pyrenean deposit, the Poudingue de Palassou. G. A. L.

Liebe, Dr. K. Th. Die Lindenthaler Hyänenhöhle und andre diluviale Knochenfünde in Ostthüringen. [The Lindenthal Hyæna-den and other kinds of Diluvial Bones in E. Thuringia.] *Gera.*

Linder, O. Observations sur la transition graduée des terrains de Bazas, de Leognan et de Salles. [Passage-beds, Miocene.] *Compt. Rend. Soc. Linn. Bordeaux*, t. xxxi. p. lviii.

Lindström, Axel. Beskrifning till kartbladet Hessleholm. (No. 61). [Description to Hessleholm Sheet.] *Sveriges Geol. Undersökn.* pp. 59. 8vo. *Stockholm.*

The Quaternary deposits "Krosstensgrus" (Till, Boulder-clay) and "rullstensgrus" or "åsar" (Kames, Eskers) are minutely described; and attention is called to the usefulness of the rocks and the quaternary deposits for industrial and agricultural purposes. Analyses of kaolin and of Cretaceous limestone, by **A. Hasselbom, H. Santesson,** and the author, are given. See notice, *post*, under "MAPS" (Sweden). E. E.

Lindström, G. Om jättegryder bildade af hafvet vid Hoburg på Gottland. [On Giants' Kettles formed by the sea at Hoburg in Gothland, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 336–338, plate.

Linnarsson, G. Fynd af Andrarumskalk på Hunneberg i Vestergötland. ["*Andrarum*-limestone" (*Regio conocoryphaeum*, Ang.)

found on Mount Hunneberg, in W. Gothland, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 346, 347.

The 6 species of fossils observed show a perfect analogy to the typical limestone in Skåne, Sweden.

Linnarsson, G. Om graptolitskiffern vid Kongslena i Vestergötland. [Graptoliteschist at Kongslena, in W. Gothland, Sweden]. *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 402–410.

The U. Graptoliteschists in W. Gothland are divided into an upper and a lower group, which latter is called "Lobiferus-schist." There are remarks on the analogy of the Swedish "Lobiferus-schist" to beds in Britain [Birkhill Shales] and Bohemia. E. E.

Lóczy, Lajós. Jegyzelek a Ponti Emelet Osztalyozásához Magyarországon. [The Pontic Series in Hungary]. *Természet. Füzet.* köt. i. pp. 110–112 (in German, pp. 129, 130).

Summary of recent works of Fuchs, Neumayr, and Boeckh.

L'Olivier, —. Sur le plissement des couches lacustres d'Auvergne dans la Limagne centrale et ses conséquences. [Folding of the Lacustrine Beds of Auvergne in Central Limagne.] *Compt. Rend.* t. lxxxv. pp. 1114, 1115.

Lossen, K. A. Kritische Bemerkungen zur neueren Taunus-Literatur. [Critical Remarks on recent 'Taunus' Literature]. *Zeitsch. deutsch. geol. Ges.* Bd. xxix. Heft 2, pp. 341–363.

Mainly argumentative, referring to views expressed by Koch or Wichmann, compared with the author's previous ones in 1867. The age of the metamorphic rocks of the Taunus, the genesis of the Sericite-schists, &c. are discussed. E. B. T.

——. [On beds below M. Devonian in Hartz Mountains.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 612–624.

Compares and parallels the different members of the L. Devonian and Hercynian, or beds intermediate between Silurian and Devonian, in the Lower Hartz, S.E. and N.W. Upper Hartz. A tabular statement is appended. E. B. T.

——. [Rhine Schists.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 846, 847.

Comparing rock-specimens from the Rhine district with others from the Hartz, a surprising resemblance is found.

Lotti, B. Sulla geologia del gruppo di Gavorrano (Provincia di Grosseto). [Geology of the Gavorrano Hills]. *Boll. R. Com. geol. Ital.* viii. pp. 53–63, woodcut.

This range, about 1800 feet above the Tuscan coast-lands, belongs to the "metalliferous chain," which is geologically distinct from the Apennine system. It consists largely of quartzites, which lie upon

Liassic rocks, and are probably Cretaceous, being succeeded by Eocene limestones (*alberese*). There is granite which throws veins into Lias limestones and produces alteration for some yards. Vom Rath's view that there are two granites of different ages is not agreed to. E. B. T.

Lotti, B. Descrizione geologica dei dintorni di Roccastrada nella Maremma Toscana. [Geology of the Environs of Roccastrada, &c.] *Boll. R. Com. geol. Ital.* viii. pp. 100–114.

The mountain-group of Montorsaio, &c. is a part of the "metalliferous chain;" its backbone consists of quartzites, conglomerates, and steatitic schists belonging to the "verrucano," on which lies Infraliassic "cavernous" limestone, surmounted by remnants of Miocene and Pliocene beds. This part of the range is separated by the trachyte mass of Sassoforte from the Boccheggiano heights, which consist of Eocene schists and limestones. In the midst of these are serpentine and gabbro rocks; the latter is said to show bedding; and they are held to be, not eruptive, but metamorphosed sedimentary rocks; they pass into Eocene schists. E. B. T.

Lucy, W. C. On the Volcanic District of Central France. Pp. 27; 6 pls. (views, section, and geological map). 8vo. *Gloucester.*

A lecture. Describes the physical features, and the granitic, volcanic, and Tertiary rocks of Auvergne.

Macar, J. de. Sur la synonymie de quelques couches de houille du bassin de Herve. [Synonymy of Coal-seams of the Herve Basin.] *Ann. Soc. Géol. Belg.* t. iv. *Bull.* pp. cxiii–cxv, folding table.

Gives the equivalence of 12 seams, in 9 Concessions.

Macchia, Prof. C. Una gita alla Majelletta nel 1875. *Chieti.*

Maganzini, Italo. [The Works executed in Belgium for the Improvement of the Course of the Meuse.] *Giornale del Genio Civile*, vol. xv. pp. 155–181. Abstract in *Proc. Inst. Civ. Eng.* vol. xl. pp. 207–210.

The geology and physical geography of the river-basin are described; also the floods and alluvial deposits of the river.

Malaise, C. Observations à propos des fossiles cambriens de l'Ardenne. [Cambrian Fossils of Ardenne.] *Ann. Soc. Géol. Belg.* t. iv. *Bull.* pp. c–cii.

Announces the presence of *Oldhamia radiata* in Revinian rocks, Fumay.

Mantovani, Prof. R. D. P. Is Man Tertiary? The Antiquity of Man in the Roman Country in relation to the Geology of the Valley of the Tiber. *Geol. Mag.* dec. ii. vol. iv. pp. 433–439, woodcut section.

Describes the Pleistocene deposits of Central Italy, and proposes the name Miolithic for the period between the Palæolithic and Neolithic epochs. Doubtful traces of Man occur in the U. Pliocene beds. W. H. D.

Marchese, Eug. Sulla distribuzione delle acque sotterranee nel distretto di Iglesias. [Distribution of Underground Waters in the Iglesias District.] *Atti R. Ac. Linc.* ser. 3, vol. i. p. 35.

The district consists of Silurian rocks. The slates weather into clay, which is eroded on the surface only; the limestones allow the passage of water by solution. The effects as proved in mining are dwelt upon. W. H. D.

Marignac, — de. Sur un bloc erratique de granite des environs de Genève. [Granite Erratic near Geneva.] *Compt. Rend.* t. lxxxv. p. 563.

Announces the probable destruction of this celebrated boulder, described by Deluc, 300 cubic metres in volume. Claims the intervention of the Academy to prevent this. G. A. L.

Marinoni, C. Contribuzioni alla geologia del Friuli. [Geology of Friuli.] Pp. 50. 8vo. *Venice.*

Martens, E. von. [Shells from the Loess of Hungary]. *Sitz. Ges. nat. Freunde Berlin*, pp. 213, 214.

List of 6 land-shells.

Martin, Jules. Le Callovien et l'Oxfordien du versant méditerranéen de la Côte d'Or. [Callovian and Oxfordian of the S. flank of the Côte d'Or.] *Bull. Soc. Géol. France,* 3 sér. t. v. pp. 178–198.

Accounts of sections, with full list of fossils, from which three main divisions are arrived at:—1. A limestone and marl series with U. Callovian species; 2. Ferruginous oolites, teeming with a mixed fauna of Oxford Clay, Calcareous Grit, Coralline Oolite, and *Ammonites-transversarius* Beds forms; and 3. Mudstones, divisible into two sub-groups, and resting on the Sponge-limestones. G. A. L.

Martin, —. Eine neue Massenablagerung silurischer Kalkgeschiebe in Oldenburg. [Silurian Limestone in Oldenburg.] *Abh. nat. Ver. Bremen*, Bd. v. Heft 2.

Matyasovszky, J. Az 1876 évi nyári idény alatt a magy. kir. földtani intézet gelógjai által eszközölt földtani felvételek eredanényc. *Budapest.*

Mayer, Ch. Sur la Carte géologique de la Ligurie centrale. [On the Geological Map of Central Liguria]. *Bull. Soc. Géol. France,* 3 sér. t. v. pp. 282–297. Translated (Studii geologici sulla Liguria centrale) in *Boll. R. Com. geol. Ital.* viii. pp. 407–425.

Explanation of the Genoa, Roccaverano, Novi, and Acqui sheets of a geological map, scale 1 : 50,000.

Mercalli, Prof. Giuseppe. Osservazioni geologiche sul Terreno Glaciale dei dintorni di Como. [Glacial Formation, Como.] *Atti Soc. Ital. Sci. Nat.* vol. xix. pp. 278–284.

Describes deposits of Glacial Drift, with littoral shells, and striated pebbles perforated by *Saxicola*, &c. See **Sordelli,** *post,* SUPPLEMENT.

Mercey, N. de. Notes sur les Croupes de la Somme à Ailly-sur-Somme, à Breilly, à la Chaussée-Tirancourt, &c. ["Croupes" of the Somme.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 337–348, woodcut.

These "Croupes" are small hillocks which occur in the lower parts of the valley. They are formed of Celtic, Gallic, and Roman deposits.

——. Sur deux questions concernant les Croupes de la Somme. Nouvelles Indications sur les Croupes de la Somme. Pp. 16. 8vo. *Amiens*. [See above.]

Meugy, —. Note sur le terrain quaternaire du Nord de la France. [Quaternary of N. France.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 223–232.

Divides the Drift into 6 groups, in ascending order: the "Éboulis" (ancient rainwashes, &c.), Grey Drift, Red Drift, Loess, Reddish Clay, and Calcareous tuff. G. A. L.

Meunier, Dr. Stanislas. Sur un alios miocène des environs de Rambouillet. [Miocene Moorband near Rambouillet]. *Compt. Rend.* t. lxxxv. pp. 1240-1243.

Shows that between the marine Fontainebleau beds and the lacustrine deposits of the Beauce traces of a land-surface are found.

Michel-Lévy, —, and — Douville. Observations sur l'âge géologique du Kersanton de la Rade de Brest. [Age of the Kersanton of Brest Roads.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 348–350.

The age given by Dr. C. Barrois to this rock (pre-Carboniferous) was arrived at previously by the authors by means of microscopic examination alone. G. A. L.

Michel-Lévy, —, and Ch. Vélain. Sur les failles du revers occidental du Morvan. [Faults of the W. flanks of the Morvan.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 350–363; 9 figures.

These faults are thus tabulated:—N. and S. faults: Bazoches, N. 8° E., and Grand-Island; N., N.N.E., and S.S.W. Faults: Chaumes-de-Pontaubert, N. 22° E., and Annéot, N. 32° E. Their chief result has been a general N. and W. dip of the Jurassic rocks. G. A. L.

Miller, Dr. K. [The Marine Molasse (Miocene) of the Bodensee District.] *Schrift. Ver. Gesch. Bodens.* Heft 7.

Milne, Prof. J. Across Europe and Asia.—Travelling Notes. *Geol. Mag.* dec. ii. vol. iv. pp. 289–297, 337–346, 389–406, 459–468, 511–518, 557–568.

Geological notes of route from Hull, by Stockholm, St. Petersburg, Perm, Ekaterinberg, Tomsk, and Irkutsk to L. Baikal. Special attention is paid to glacial phenomena. W. H. D.

Mösch, Dr. Cas. Reisebericht über seine diesjährigen geologischen

Beobachtungen. [Notes of Geological Travel in 1876.] *Verh. schweiz. naturf. Ges., Jahresb.* 1875–6, pp. 256–266.

Comprises notes on Jurassic rocks S. and W. of the Lake of Brienz, &c.

Monterosato, Marchese di. Catalogo delle Conchiglie fossili di Monte Pellegrino e Ficarazzi presso Palermo. [Catalogue of Fossil Shells of M^{te} Pellegrino and Ficarazzi.] *Boll. R. Com. geol. Ital.* viii. pp. 28–42.

In this catalogue of fossils from one of the best Post-pliocene localities in Italy are separately grouped those living in the Mediterranean (411 species), those not there found but which live in the Atlantic (27 species), and those not yet found alive (66 species). E. B. T.

Mueller, Prof. A. Ueber die anormalen Lagerungsverhältnisse im westlichen Basler Jura. [Anomalous Sections in Jura Mts. near Bâle.] *Verh. nat. Ges. Basel,* Th. vi. Heft 3, pp. 428–462; plate (sections).

Describes a series of sections in the Jura above Bâle, where older beds are thrust over newer by overlap faults: *e. g.* in the Bretzwyl section, Keuper Lias and Inf. Oolite are seen overlying Corallian; in the Hauenstein tunnel, the Muschelkalk lies upon Tertiaries which seem to be below. These dislocations occur only on the S. side. Their cause during the elevation of the Wiesenberg, Mt. Terribile chain, is discussed. E. B. T.

Muschketoff, —. [Materials for a Knowledge of the Geology and of the Mines of the Zlatoust Mining District, in Southern Ural.] With geol. map.

Nathorst, A. G. Beskrifning till kartbladet Stafsjö. No. 57. [Description of Stafsjö Sheet.] *Sveriges Geol. Undersökn.* pp. 64; plate and 3 woodcuts (sections of Quaternary deposits). 8vo. *Stockholm.*

The varieties of gneiss and granite are minutely described, and their relations to each other explained. Analyses, by **A. Hasselbom,** of granular limestone, glacial sand, glacial clay, and freshwater ooze ("gyttja") with shells, are given. See notice *post,* under MAPS (Sweden). E. E.

——. Beskrifning till kartbladen Sandhamn och Färnskär. Nos. 58 & 59. [Description of Sandhamn and Färnskär Sheets.] *Sveriges Geol. Undersökn.* pp. 27; woodcut. 8vo. *Stockholm.*

See notice *post,* under MAPS (Sweden).

——. Om de kambriska och siluriska lagren vid Kiviks Esperöd i Skåne, jemte anmärkningar om primordialfaunans lager vid Andrarum. [Cambrian and Silurian Beds at Kiviks Esperöd, with Remarks on the Primordial Beds at Andrarum, in Skåne, Sweden.] *Geol. Fören. Stockholm. Förh.* Bd. iii. pp. 263–270.

At the former place the Cambrian and Silurian beds represent several different horizons from the Fucoidal sandstone, at the bottom, up to the Brachiopod-schist. The fossils are noted. As to Andrarum, the author sets right some errors in a previous paper, on the succession of the Cambrian deposits. A list of fossils in the different beds is given. E. E.

Nathorst, A. G. Nya fyndorter för arktiska Växtlemningar i Skåne. [New Localities for Fossil Arctic Plants in Skåne, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 293–319. Reprinted *Sver. Geol. Undersökn.* p. 29.

13 localities are described where fossil arctic plants have been found in freshwater deposits, ordinarily below peat. The most common species are noted, and a list of 24 species of lichens is given. E. E.

——. Om de glaciale Ferskvandsdannelsers Bidrag til Kundskaben om Istidens Plantevæct. [Glacial Freshwater Deposits and their contribution to the Knowledge of the Flora of the Glacial Period.] *Tidskrift for populære Fremstillinger af Naturvidenskaberne*, 5 Række, 4 Bind, pp. 284–305. *Copenhagen.*

Has found fossil remains of arctic plants in and under peat-bogs in Skåne (Sweden) and Denmark, as well as in Mecklenburg, Bavaria, Switzerland, and England. Gives an account of the occurrence and distribution of an arctic and alpine flora in former times and at present. Describes the Swedish locality for arctic plants, &c. at Qvesarum, in Skåne. E. E.

Neumayer, Dr. M. Ueber einen Conglomeratgang im Karpathensandstein des Unghvarer Comitates in Ungarn. [Vein of Conglomerate in Carpathian Sandstone in Unghvarer County, Hungary.] *Verh. k.-k. geol. Reichs.* no. 8, pp. 126, 127; 2 woodcuts.

——. Die Zone der *Terebratula Aspasia* in den Südalpen. [*T. Aspasia* Zone in the S. Alps.] *Verh. k.-k. geol. Reichs.* no. 11 pp. 177, 178.

Notes localities, in the neighbourhood of St. Cassian, where a fauna approaching that of Gemellaro's Sicilian zone of *T. Aspasia* occurs.

——. Ueber einige neue Vorkomnisse von jungtertiären Binnenmollusken. [Recent Discovery of U. Tertiary Bivalves.] *Verh. k.-k. geol. Reichs.* pp. 366–368.

From the Paludina-beds of W. Wallachia.

——. Bemerkungen über den russischen Jura. [Russian Jura.] *N. Jahrb.* Heft viii. pp. 791–797.

Controversial. Objects to Trautschold's correlation of certain Jurassic beds in Russia with those of W. Europe (see p. 100), and differs as to the methods of palæontology, and the principles on which geological conclusions are drawn from palæontological data. F. W. R.

Ochsenius, C. Die Bildung der Steinsalzlager und ihrer Mutterlaugensalze unter specieller Berücksichtigung der Flötze von Douglashall in der Egeln'schen Mulde. [Formation of Rocksalt and Salts of the Mother-liquor, with special reference to the Deposits of Douglashall.] 8vo. *Halle.*

Omboni, Prof. G. Il Mare glaciale e il Pliocene ai Piedi delle Alpi Lombarde. [The Glacial Sea and the Pliocene at the foot of the Lombard Alps.] *Atti Soc. Ital. Sci. Nat.* vol. xix. pp. 372–384.

Regards the fossiliferous Drift, supposed to be early Glacial or late Pliocene, as a torrent-alluvium, due to the melting of the ice at the end of the Glacial period, and formed from moraines and Pliocene beds. W. H. D.

Orth, Dr. A. Rüdersdorf und Umgegend auf geognostischer Grundlage agronomisch bearbeitet. [Agricultural Geology of the Rüdersdorf District.] *Abh. geol. Specialkarte Preuss.* Bd. ii. Heft 2, pp. ix, 114 (or 151–264); map.

The agricultural geology of the Rüdersdorf district (principally Drift with a little L. and M. Trias) is described. Many sections and analyses of rocks and of soils are given. W. H. D.

Orueta, Domingo. Bosquejo Fisico-Geológico de la Region septentrional de la provincia de Malaga. [Physical Features and Geology of the N. Part of the Province of Malaga.] *Bol. Com. map. geol. Españ.* t. iv. pp. 89–170; geol. map and section.

Climate, physical features, &c., pp. 96–123; Geology, &c., pp. 124–170. Mention is made of the salt lake called Fuentepiedra; and an account is given of the geology of the district. The map shows 12 divisions. J. F.

Pantanelli, D. Dei Terreni Terziari intorno a Siena. [Siena Tertiaries.] *Atti Mus. R. Ac. Siena,* ser. 3, vol. i. p. 235.

Pareto, R. [Diversion of the Brenta from the Lagoon of Chioggia.] *Giornale del Genio Civile,* vol. xiv. p. 515. Abstract in *Proc. Inst. Civ. Eng.* vol. xl. pp. 210–213.

A description of the Venetian lagoons, their formation and modern changes.

Partridge, W. D. Note sur la Roche des Demoiselles de Fontenailles. *Bull. Soc. Géol. Norm.* t. iii. pp. 58–61 (and p. 31).

This rock seems to be 7 or 8 metres high. Thinks it is not a block fallen from the cliff, nor the remains of a former cliff, but owes its origin to a fault. W. W.

——. Note sur la Couche d'Argile entre la Craie et le Diluvium, Falaises de Bléville. [Bed of Clay between the Chalk and the Drift, Bléville Cliffs.] *Bull. Soc. Géol. Norm.* t. iii. pp. 62, 63.

A thin bed of brown plastic clay, sometimes greenish, in some places separates the Chalk from the red clays with flints, in hollows.

Paul, C. M. Ueber die Natur des karpathischen Flysches. [Carpathian Flysch.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. Heft 4, pp. 431–452.

Examines the facts and arguments on which Fuchs founded his

notion that the Flysch was due to mud-volcanoes, and finds that it cannot be sustained. 1. Chemical analyses are adduced to show that the sediment does not agree in composition with that of mud-volcanoes, neither are conglomerates absent in the W. Carpathians. 2. No weight can be attached to the argument that petroleum occurs in it, because most rock-oil comes from the Neogene salt formation, and, secondly, it is *primâ facie* a proof of organic remains rather than of vulcanicity. 3. The foreign rocks included in the series are of such diverse kinds that they could not be brought together by action from below: they are rather a proof of a series of beds which have now disappeared. 4. The large masses (Blockklippen) are many of them only a few kilometres apart, are of the same rock, have the same strike, and are therefore evidently not detached. 5. Nothing can be founded on the absence of fossils, because they occur in various localities, as Wernsdorf, &c. 6. The contortions supposed to be characteristic of the Flysch occur also in the Neogene salt formation of Galicia. E. B. T.

Paul, C. M. Petrefaktenfund im Karpathensandstein. [Discovery of Fossils in Carpathian Sandstone.] *Verh. k.-k. geol. Reichs.* no. 11, pp. 185, 186.

Note of occurrence.

Paul, C. M., and Dr. Emil Tietze. Studien in der Sandsteinzone der Karpathen. [Carpathian Sandstone-zone.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. pp. 33–130; 7 cuts.

The part of the Carpathians examined is that near Stanislau, including the valleys of Czeremosz and Bistritza, &c. The beds are compared with adjacent territories of Bukowina and Austrian Silesia; and are divided into three:—a lower division which is L. Cretaceous, Neocomian, &c., an upper one which is Eocene, while the middle does not allow of any exact correlation with normal formations. In the first iron-ores are worked. Fossils, except fucoids, are rare, but Ammonites and *Aptychus* have been found in the lower group, and Fish and Nummulites in the Eocene division. E. B. T.

Penck, A. Nordische Basalte im Diluvium von Leipzig. [Northern Basalt in Leipzig Drift.]

Pettersen, K. Om Fjord- og Dal-dannelsen inden det nordlige Norge. [Formation of Fiords and Valleys in Northern Norway.] *Arch. Math. Naturvid.* Bd. ii. pp. 272–337; plate. 8vo. *Copenhagen.*

Gives an account of the existing Norwegian glaciers. Describes the Norwegian glaciers during the Glacial Period. Gives a short orographic and geologic review. Accounts for the shape and distribution of the fiords, straits, valleys, and "Ejde," and discusses their mode of origin. E. E.

——. Ueber das Vorkommen des Olivinfels im nördlichen Norwegen. (Zweiter Beitrag.) [Occurrence of Olivinestone in N.

Norway.] *N. Jahrb.* pp. 784–790; plate. Reprinted from *Geol. Fören. Stockholm Förh.* Bd. iii. See GEOLOGICAL RECORD for 1876, p. 103.

Pfaff, Dr. E. O. Die Naturkräfte in den Alpen, oder physikalische Geographie des Alpengebirges. [Physical Geography of the Alps.] 8vo. *Munich.*

Pichler, Dr. Adolf. *N. Jahrb.* Heft vi. pp. 620, 621.

Gives a section in the N. Alps showing the succession of beds, and the position of the ore-bearing "Schwatzerkalk," a limestone immediately above the Wildschönau slates. F. W. R.

Pilar, G. Ueber die geologischen Verhältnisse der Gegend von Radoboj in Croatien. [Geology of the Country round Radoboj, in Croatia.] *Verh. k.-k. geol. Reichs.* no. 6, pp. 99–102.

Résumé of the Geological Survey of the district, with notes of the Tertiary plants and their localities.

Pilide, C. D. Ueber das Neogen-Becken nördlich von Ploeschi (Walachei). [The Neogene Basin N. of Ploeschi.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. pp. 131–142.

The Neogene basin in this part of Wallachia exhibits the following beds:—1. L. (first) Mediterranean stage; this yields the salt of the Roumanian workings; 2. Second Mediterranean; 3. Sarmatian; 4. Congeria beds, with the lignite and petroleum workings. Lists of fossils given. E B. T.

——. Petrefaktenfund im Karpathensandsteine. [Discovery of Fossils in Carpathian Sandstone.] *Verh. k.-k. geol. Reichs.* no. 4, p. 71.

Note of discovery of *Acanthoceras mamillare* Schl., an Albian form, in the Prahovathal, near Sinaia, in Wallachia.

Piquet, A. Mémoire sur la richesse minérale de la province de Santander. [Mineral Resources of Santander.] Pp. 55; 3 pls. *Paris.*

Pirona, G. A. Schizzo geologico della provincia di Udine. [Geological Sketch of Udine District.] *Boll. R. Com. geol. Ital.* viii. pp. 114–137. Reprinted from "Cenni sulla Provincia di Udine sotto l'aspetto storico e naturale." Pp. 64. 8vo. *Udine.*

Notices Carboniferous beds (dark marine limestones, beds with coal-plants), Permian, quartzose and micaceous schists. Trias, 9000 feet thick (conglomerates and sandstones, Muschelkalk limestones, dolomite limestones, sandy and gypseous beds of U. Trias, Raibl fossils being abundant in places). Above the Trias is Infralias dolomite, U. Lias, U. Oolite, and Tithonian; of Cretaceous, Neocomian and *Rudistes* beds are present. Eocenes are fragmentary, having been much denuded: Miocene and Pliocene are also represented. E. B. T.

Pohlig, Hans. Der archäische District von Strehla bei Riesa i S. [Archæan District of Strehla.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. Heft 3, pp. 545–591.

The Strehla rocks form an island of Archæan beds rising out of the Diluvial plain E. of Leipzic. In the petrographical chapter are noticed and described, among others, Gneiss, in places syenitic, or containing amphibolite layers, &c., Mica-schist, Cornubianite-gneiss; among the mica-schists are conglomeratic schists with pebbles of the rocks below, gneiss, &c. imbedded in an entirely crystalline cement; the pebbles are usually oval, and vary from the size of a bean to that of a child's head; they fall readily out of the matrix: above come andalusite- and chiastolite-schists, phyllites, sericite-phyllites, &c. In succeeding chapters the origin of the rocks is discussed, and, in opposition to Naumann, it is affirmed that there is no eruptive granite in the district; all the granitic rocks are referred to the Archæan: according to this view no pyrometamorphic explanation for the andalusite schists, &c. can be adopted. E. B. T.

Potier, —, and A. de Lapparent. Résultat des explorations géologiques faites en 1875–1876 pour les études du chemin de fer sous-marin entre la France et l'Angleterre. [Exploration for the Channel Tunnel, 1875–76.] *Compt. Rend.* t. lxxxiv. pp. 1331–1333.

Based on soundings and the Sangatte boring. No difficulty from faults is anticipated in driving the Tunnel.

Purgold, —. Ueber die Bildung des Aussig-Teplitzer Braunkohlengebirges. [Lignite beds of Aussig-Teplitz.] *Mitth. nat. Ver. Aussig.*

Radimsky, V. Die Insel Pago in Dalmatien und deren Lignit-Vorkommen. [Geology of Pago and its Lignite-beds.] *Berg- hütt. Jahrb.* Bd. xxv. pp. 325–353, pl. vi. (geol. map and sections).

Describes the geology of Pago, one of the long, narrow islands lying off the mainland of Croatia, on the E. side of the Adriatic. The rocks are chiefly Hippuritic and Nummulitic limestones, folded into a series of narrow basins containing Neogene clays and marls, with lignite beds in places. The largest basin, that of Collane, is about 5 miles long by ¾ mile greatest breadth, with from 20 to 32 feet of woody lignite usually in two seams. These have not as yet been worked to any extent.
H. B.

——. Das Lignitvorkommen auf der Insel Pago. [Lignite in Pago Is.] *Verh. k.-k. geol. Reichs.* no. 6, pp. 95–98.

Same subject as the last paper, but not a mere abstract.

——. 1. Ueber den geologischen Bau der Insel Pago. 2. Hippuritenfundort bei Scardona in Dalmatien. [1. Geology of Pago.

2. Locality for Hippurites near Scardona in Dalmatia.] *Verh. k.-k. geol. Reichs.* no. 11, pp. 181–183; woodcuts (sections across the island).

Rambotti, Vincenzo. La formazione granitica lungo la Ferrovia tra la marina di Catanzaro e quella di Soverato. [Granite of Catanzaro, &c.] *Boll. R. Com. geol. Ital.* viii. pp. 64–69.

The granitic rocks come down to the shore in several promontories, and are pierced by three tunnels; several varieties are noted. The gneiss is supposed to be an eruptive rock; it contains fragments of other granitic rocks; the apparent bedding planes are said to differ from those of any sedimentary rock. E. B. T.

Rath, G. vom. I monti di Campiglia nella Maremma Toscana. [Campigliese Geology.] Translated from *Zeitsch. deutsch. geol. Ges.* Bd. xx. (1868), with notes by **Dr. B. Lotti.** *Boll. R. Com. geol. Ital.* viii. pp. 187–196, 278–305, 325–350; 6 woodcuts.

Describes veins seen in the large Etruscan workings. In one opening the vein enclosed in white marble has selvedges of radiating augite, next which is ilvaite, then augite-porphyry succeeded by quartz-porphyry, and epidote separating this from the augite-porphyry. The spheroidal masses of radiating augite are sometimes 2½ metres in diameter. The veins cannot be classed under any head hitherto described. The ilvaite is thought to have been formed by the fusion of iron-silicate with limestone. During the centuries since their abandonment a stalagmite has formed containing hydrated copper-silicate, gypsum, &c.; gypsum lines the walls, and incrusts them with crystals. E. B. T.

——. Bericht über eine geologische Reise nach Ungarn im Herbste 1876. [Geological Tour in Hungary in 1876.] Pp. 82. *Verh. nat. Ver. preuss. Rheinl.* ser. 4, Bd. iv.

Regnault, F. Grotte du Mas d'Azil (Ariège). [Mas d'Azil Cave.] *Bull. Soc. Hist. Nat. Toulouse,* t. xi. p. 128.

Renevier, Prof. E. Notice sur ma Carte géologique de la Partie Sud des Alpes Vaudoises. [Geological Map of Vaudois Alps.] *Arch. Sci. Phys. Nat.* lxi. pp. 1–49, pl. 1.

A notice of his map of the Diablerets and Dent de Morcles district—the highest part of the Canton de Vaud Alps—and the outcome of 25 years' work. The lowest beds after the metamorphic are the Carboniferous, then follow representatives of Trias, Jura, L. Cretaceous to Cenomanian; the Chalk is absent; Eocene, consisting of Nummulitic and Flysch, are the highest beds. E. B. T.

——. Notice sur les Blocs Erratiques de Monthey, Valais. [Erratic Blocks of Monthey.] *Bull. Soc. Vaud. Sci. Nat.* sér. 2, vol. xv. pp. 105–116, pl. vii. (view).

Describes the position, &c. of two large erratics.

Reusch, H. H. Grundfjeldet i söndre Söndmör og en Del af Nordfjord. [Primitive Rocks in S. Romsdal, Norway.] *Forh. Vid.-Selsk. Christiania*, pp. 18; 18 woodcuts and geol. map.

Notes on the character, distribution, and mode of occurrence of gneiss and gneiss-granite, granular limestone, gabbro, eclogite, and olivine-rock. The woodcuts illustrate the arrangement, the structure, and relative positions of the rocks. On the map the travelling-routes are marked with dotted lines. E. E.

——. Nogle norske Huler. [Norwegian Caves.] *Naturen, et illustreret Maanedsskrift for populær Naturvidenskab.* Nos. 1, 4, 6. Pp. 22; 19 woodcuts. 4to. *Kristiania.*

Description of 7 caves in gneissic and granite rocks on the W. coast of Norway. On the bottom of some of the caves were found implements of bone and of iron, believed to belong to the so-salled "iron age" of Scandinavia. The caves were excavated by the action of the waves in places where the rock was weakened by rents and fissures. E. E.

Reyer, Dr. Ed. Die Euganeen, Bau und Geschichte eines Vulcanes. [The Euganæans. Structure and History of a Volcano.] Pp. 95; 16 cuts, and geol. map. 8vo. *Vienna.*

A history of this volcano, containing:—1. Notice of the oldest seen sedimentary rocks, U. Jurassic; in the U. Cretaceous (*scaglia*) period the volcano was in a submarine stage, the first products being trachytes and tuffs; augitic and more basic rocks gradually succeeded; and in the Eocene were erupted first plagioclase-augite rocks, and in a higher division plagioclase-hornblendic; a passage then follows through sanidine-augite rocks to the second (Tertiary) trachyte eruption, the volcano being then subaërial and extensive; quartz-trachyte and rhyolites occur, with breccias and tuffs; augite-andesites close the series. 2. Tectonic relations and structure; radial dykes and focus; distinction into dykes of eruption and injection. 3. The mixed and interlacing character of the magma beneath, to account for the change of acid and basic rocks in alternating eruptions. 4. Sinking of the volcanic centre; jointing of lava-streams, and action of water thereon; denudation of the district; fault-valleys and erosion-valleys, &c. Facts relating to volcanoes generally discussed incidentally. E. B. T.

Rey-Lescure, —. Dislocation dans les terrains du Sud-Ouest de la France. Systèmes du Quercy, du Castrais, des Pyrénées et de l'Auvergne. [Dislocations in S.W. France.] *Bull. Soc. Géol. France*, 3 sér. t. v. pp. 199–212, and *Bull. Soc. Hist. Nat. Toulouse*, t. xi. p. 107.

An attempt to class the known and supposed lines of upheaval and faulting in this region according to systems of direction.

Ribeiro, C. [Quaternary, Tejo, and Sado Basins.] *Geological Survey of Portugal*, and *Mem. Lisbon Acad. Sci.*

Robert, Dr. Eugène. Sur les crevasses du terrain crétacé. [Fissures of the Cretaceous Rocks.] *Compt. Rend.* t. lxxxiv. pp. 512, 513.

——. Note sur la dislocation de la craie dans les environs de Sézanne. [Dislocation of the Chalk in the Neighbourhood of Sézanne.] *Compt. Rend.* t. lxxxiv. p. 798.

——. [Pebbles at Vauxcelles, near Vailly (Aisne).] *Compt. Rend.* t. lxxxiv. pp. 1520, 1521. (Abstract.)

——. Sézanne au point de vue préhistorique. [Prehistoric Sézanne.] 8vo. *Sézanne.*

——. Sézanne, au point de vue paléontologique. [Sézanne from a Palæontological Point of View.] 8vo. *Sézanne.*

Rochlitzer, Joseph. Beiträge zur Geologie des Fruskagora. [Geology of the Fruskagora.] *Verh. k.-k. geol. Reichs.* no. 9, p. 159.

Abstract of a paper read to the Hungarian Geological Society at Budapest.

Roemer, Prof. Ferd. Notiz über das Vorkommen des Moschus-Ochsen (*Ovibos moschatus*, Bl.) im Loess des Rheinthals. [Musk-ox in Rhine Valley.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 502, 503.

In Loess, lying on basalt at Unkel, about 50 feet above the Rhine, was found an imperfect skull of musk-ox, together with mammoth, rhinoceros, reindeer, horse, &c. This is the fifth occurrence in Germany. E. B. T.

Rolland, G. Mémoire sur la géologie de Kongsberg (Norwège). [Geology of Kongsberg, Norway.] *Ann. Min.* sér. 7, t. xi. pp. 391–485, pls. viii.–xi.

The rocks of the district are fundamental gneiss, ancient granite, gabbro, syenite, and black porphyry. The lodes of Vinoren, Underberg, Overberg, and the King's Mine are fully described. The minerals filling the veins are quartz, calcspar, barytine, fluorspar, anthracite, iron and copper pyrites, galena, blende, titanite, anatase, wavellite, adularia, albite, grammatite, axinite, pistacite, amphigenite, prehnite, harmotome, apophyllite, desmine, stilbite, laumonite, clay, talc, chlorite, epidote, mica, native silver and arsenic, argentite, stephanite, pyrargyrite, chloride of silver, gypsum. G. A. L.

Rolland-Banès, L. Notice sur un voyage géologique dans le bassin carbonifère du nord de la France et de la Belgique. [Carboniferous Basin of N. France and Belgium.] Pp. 35; 5 pls. *Havre.*

Roscher, C. G. Der Bergbau zu Scharfenberg bei Meissen. [Geology of Scharfenberg.] *Sitz. Isis Dresden* for 1876, pp. 113–119.

Rosenbusch, H. Die Steiger Schiefer und ihre Contactzone an den Granititen von Barr-Andlau und Hohwald. [The Steiger Schiefer and their Contact with the Granites of Barr-Andlau and Hohwald.] *Abh. geol. Specialkarte Elsass-Lothr.* Bd. i. Heft 2, pp. 79-393, geol. map and 2 pls. (sections and rock-section).

Describes the mode of occurrence of these Devonian rocks, and the alterations near their contact with certain granitic rocks. Many complete analyses are given, and tables showing the mineral constitution of these rocks. F. R.

Rösing, —. Die Verwerfung des Nebengesteins durch die Lautenthaler Erzgänge. [The Displacement produced by the Lautenthal Mineral Lodes.] *Zeitschr. Berg- Hütt. Salinenw.* Bd. xxv., *Abhandlungen*, pp. 280–285, pl. xiii. (plans and sections).

The hanging wall of this great parallel series of lodes is of Grauwacke of the Culm period, the foot wall of alternating Devonian schists and limestones, bent into numerous curves in a direction normal to the strike of the lode. As far as can be made out, the vertical throw of the strata on opposite sides of the lode-fracture varies from about 490 to 650 feet. H. B.

Roth, Justus. Studien am Monte Somma. [Studies on Monte Somma.] *Abh. k. Ak. Wiss. Berlin*, pp. 48. Translated in *Boll. R. Com. geol. Ital.* viii. pp. 440–451.

Describes the position, nature, &c. of volcanic rocks; giving analyses.

Rütimeyer, L. Der Rigi, Berg, Thal und See. Pp. vii, 160; plates. 4to. *Basle, Geneva, Lyons.*

Rutot, A. Sur la Faune de l'étage inférieur du Système Landénien. [Fauna of L. Landenian.] *Ann. Soc. Géol. Belg.* t. iv. pp. 3–7.

Gives lists of fossils from the L. Landenian beds of Belgium.

Sandberger, [Dr.] F. *N. Jahrb.* Heft i. pp. 57–59.

Preliminary notice of geological work near Würzburg, Shapbach, Basle, &c.

Saporta, Count G. de. Sur le climat des environs de Paris à l'époque du diluvium gris, à propos de la découverte du laurier dans les tufs quaternaires de la Celle. [Climate of Paris at the Time of the Grey Drift, with reference to the Discovery of the Laurel in the Quaternary Tuffs of La Celle.] 8vo. *Clermont-Ferrand.*

Schlüter, Cl. Verbreitung der Inoceramen in den Zonen der norddeutschen Kreide. [Distribution of *Inoceramus* in German Cretaceous.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 735–742.

Gives the order of occurrence of *Inoceramus* species, zone by zone, in the N. German Cretaceous, the first being in the Gault. Table at end. E. B. T.

Schmidt, Fr. [Russian Loess, &c.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 830–832, 836, 837.

The Loess covers a large area in S. Russia, but seems to follow the river-courses; it forms the subsoil to the fruitful "black earth." Alleges that Lake Baikal had no connection with the polar seas, the forms in it being all peculiar; also the Aralo-Caspian basin was cut off from N. seas, being only connected by rivers, which would account for the few fishes common to both. E. B. T.

Schrader, —. Die neueren Aufschlüsse der Kalisalzlagerstätte von Stassfurt. [Potash Salt Deposit of Stassfurt.] *Zeitschr. Berg-Hütt. Salinenw.* Bd. xxv., *Abhandlungen*, pp. 319–332, pl. G (sections).

Contains details of the discoveries made by borings and sinkings in the Magdeburg Halberstadt salt-basin at Stassfurt, Douglashall, Leopoldshall, and other places. There seem to be two principal beds of rock-salt, the upper less important than the lower, which is several hundred yards thick, and is immediately overlain by the potash salt-bed. The last has a minimum thickness of 65 feet, and is considered to be purest along the strike for about 12½ miles. The relation of the Kamite bed to the other salts is very irregular, it being found at Leopoldshall above the Carnallite, and at New Stassfurt below it. In either case, however, the former mineral is a product of the alteration of the latter. H. B.

Schubert, —. Ueber einen bituminösen Schiefer von Klein-Shotta. [Bituminous Slate at Klein-Shotta.] *Verh. Nat. Ver. Brünn*, Bd. xv.

Scrive, —. Communication sur le gisement de Cuivre Argentifère des mines de la Prugne et Charrier dans le département de l'Allier. [Argentiferous Copper in Allier.] *Mém. Soc. Sci. Agr. Arts Lille*, sér. 4, t. iii. (See GEOLOGICAL RECORD for 1876, p. 109.)

Seguenza, G. Studii stratigrafici sulla Formazione pliocenica dell' Italia Meridionale. [Pliocene Fossils of S. Italy.] *Boll. R. Com. geol. Ital.* viii. pp. 7–17, 91–99, 359–367.

Continuation of the catalogue of cirripeds and mollusks of the upper zone of the Older Pliocene. [See GEOLOGICAL RECORD for 1876, p. 292.]

Sjögren, A. Anteckningar rörande gång- och lagerbildningar. [Notes on Veins and Layers.] *Geol. Fören. Stockholm Förh.* Bd iii. pp. 399–402, plate.

Notes on a highly flexed and contorted dark-coloured string in white granular limestone, which string, very much resembling a trap-vein, is a veritable layer. The limestone does not show any lines of deposit. [Refers to Sweden.] E. E.

Speyer, O. [Saxon New Red.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 204–206.

Verbal communication. Notices fossiliferous dolomites below the gypsum. 14 species cited.

Speyer, O. [On *Pedina aspera* beds.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 852–859.

Pedina aspera, Ag., was found near Dörneburg for the first time in N. Germany; it comes from the M. Corallian. Section of the beds with lists of fossils given. E. B. T.

Stache, Dr. G. Aufnahmen in West-Tyrol. [Surveys in W. Tyrol.] *Verh. k.-k. geol. Reichs.* no. 6, pp. 106, 107.

Brief summary.

——. Fusulinenkalke aus Ober-Krain, Sumatra und Chios. [Fusulina Limestone from U. Illyria, Sumatra, and Chios.] *Verh. k.-k. geol. Reichs.* for 1876, pp. 369–371.

Stache, Dr. G., and **Conrad John.** Geologische und petrographische Beiträge zur Kenntniss der älteren Eruptiv- und Massengesteine der Mittel- und Ost-Alpen. [Eruptive and Crystalline Rocks of E. Alps.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. Heft 2, pp. 143–242, pls. 1, 2.

Part 1 deals specially with the rocks of the Zwölferspitze in W. Tyrol, with a general introduction on the watershed between the Etsch and the Adda; under the latter head the whole series of gneiss-phyllites which lie at the base of the crystalline schists, including hornblendic schists, &c., quartz-phyllite and wacke-gneiss, dolomites, &c., are described, with granites and haplophyre intermediate between granite and porphyry. The rocks of the Zwölferspitze at the head of the Etsch valley are enumerated in detail; they belong to the gneiss-phyllite group, and include a new group of eruptive rocks not previously described in Tyrol and Switzerland, belonging to the diabase family, &c., having their nearest allies in the proterobase and keratophyre of the Bavarian Fichtelgebirge. A section of basic and acid rocks lying together as layers in gneiss, from the phenomena exhibited, are held to be old flows; for an intrusion would not account for their relations to each other and to the gneiss, the quartz-porphyry being the later of the two. A large series of porphyrites, quartz-porphyries, &c. are analyzed microscopically and chemically. E. B. T.

Stefani, Carlo de. I dintorni di Monsummano e di Monte Catini in Val di Nievole. [Environs of Monte Catini, &c.] *Boll. R. Com. geol. Ital.* viii. pp. 42–53, woodcut.

Monsummano is an anticlinal, the beds reversed on the land side, the L. Lias being the oldest rock; the M. and U. Lias follow, and succeeding these the flags of U. Cretaceous and Eocene. The Pliocene wraps round the whole ridge, flooring the valley and plain. The Postpliocene travertin is subsequent to the denudation which has caused the terraces in the Pliocene. E. B. T.

Stefani, Carlo de. Descrizione degli strati pliocenici dei dintorni di Siena. [Pliocene near Siena.] *Boll. R. Com. geol. Ital.* viii. pp. 155–186, 248–278; 8 woodcuts.

1. History of previous investigations, giving the views of various authors, various divisions of Pliocene beds, with lists of fossils from each bed, and descriptions of sections. 2. Fossils from various facies of beds, brackish water, &c. Discussion on the epochs to which the beds described belong: places them in the Pliocene; holds that the divisions "Messinian," "Astian," &c. are of no general value in proof of superposition. E. B. T.

——. L'Oligisto e gli altri minerali che si trovano al Capo Calafuria. [Oligiste, &c. of C. Calafuria.] *Boll. R. Com. geol. Ital.* viii. pp. 72–77.

Notes that the Oligiste occurs in geodes, &c. in Eocene beds, and thinks it contemporaneous with the formation of the beds, not subsequently introduced by veins. E. B. T.

——. Brevi appunti sui terreni pliocenici e miocenici della Toscana. [Pliocene and Miocene of Tuscany.] *Boll. R. Com. geol. Ital.* viii. pp. 392–398.

Summarizes results as to the age of various beds among Tuscan Tertiaries, about which there have been controversies.

Stephanesco, —. Note sur le bassin tertiaire de Bahua (Roumanie). [Tertiary Basin of Bahua, Roumania.] *Bull. Soc. Géol. France,* 3 sér. t. v. pp. 387–393, pl. v.

Describes for the first time a small Tertiary basin north of the Iron Gates. The beds are L. and U. Miocene, resting upon mica-schist. Measured sections and lists of fossils are given. G. A. L.

Stoehr, Emil. [Tripoli-beds of Sicily.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 638–643.

The Tripoli-bed is at the base of the sulphur-bearing beds, which are mostly freshwater; but the "trubi" at top and the "tripoli" below are marine. The latter cannot be newer than the upper beds of the Tortonian. E. B. T.

Stossich, M. Sulla geologia e zoologia dell' isola di Pelagosa. [Geology of Pelagosa.] *Boll. Soc. Adr. Trieste,* vol. iii. See Geological Record for 1876, p. 363 (1875).

Struckmann, C. Ueber die Fauna des unteren Korallen-Ooliths von Völksen am Deister unweit Hannover. [Corallian of Völksen.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 534–544.

Notes the occurrence of *Cidaris florigemma* in Corallian here, though not previously cited; gives section, and adduces a list of fossils, many of which have not been noted in N. Germany; remarks on the greater likeness of the Hanover Oolite to the Swiss and S. German equivalents than has hitherto been recognized. Proposes to place the *Terebratula humeralis* beds in the base of the Kimmeridgian. E. B. T.

Svedelius, G. T. f. Bergmästarens vid guldvaskerierna i finska Lappmarken till Bergsstyrelsen afgifna berättelse om guldletnings- och vasknings-arbetet under året 1877. [Report on Gold-digging and Gold-washing at the Finlandic Gold-works in 1877.] *Helsingfors.*

Szabó, Dr. Jos. Nyirok und Löss im Ofener Gebirge. [Nyirok and Löss in the Ofen Mountains.] *Verh. k.-k. geol. Reichs.* no. 9, pp. 158, 159.

Abstract report (by **B. v. Inkey**) of a paper read at a meeting of the Hungarian Geological Society. Nyirok is the name given to a local Drift, older than the Löss, and formed by the decomposition of trachytic rocks. G. A. L.

Taramelli, Prof. T. Alcune Osservazioni sul *Ferretto* della Brianza. [The *Ferretto* of the Brianza.] *Atti Soc. Ital. Sci. Nat.* vol. xix. pp. 334–371, pl. 7 (geol. map of Milan district).

The *Ferretto* is a clayey moraine deposit of early Glacial or late Pliocene age; its deep red colour is due to meteoric decomposition of the felspathic porphyry, &c. contained, and to the oxidation of the iron thereof. W. H. D.

——. Osservazioni stratigrafiche sulla provincia di Pavia. [Stratigraphy of Pavia.] Pp. 20. 8vo. *Milan.*

Tardy, A. Observations sur la position stratigraphique des Silex taillés tertiaires. [Stratigraphical Position of the Tertiary Worked Flints.] *Bull. Soc. Géol. France,* sér. 3, t. v. pp. 58–60, folding table.

Denies the *proved* existence of Man prior to the period (late Quaternary) during which the glaciers decreased and retired in France.

——. Quelques Mots sur la Stratigraphie de l'Époque Miocène. [Miocene Divisions.] *Bull. Soc. Géol. France,* sér. 3, t. v. pp. 122–125.

Gives a comparative table of the Miocene deposits of Paris (according to the author), Barrême (according to A. Garnier), Aurillac (according to Ramès), Turin, Bresse and Jura, and general (according to Renevier). G. A. L.

——. Identité de situation des dépôts crétacés de la côte Châlonnaise et du Sud-Ouest du Jura. [Identical Position of the Cretaceous Beds on the Châlonnais Flank and in S.W. Jura.] *Bull. Soc. Géol. France,* sér. 3, t. v. pp. 385–387.

Terrigi, Dr. G. Considerazioni geologiche sul Quirinale. [Geology of the Quirinal.] *Atti R. Ac. Linc.* ser. 3, vol. i. p. 209.

Describes the Pliocene beds.

Tietze, Dr. E. Reisebericht aus Ostgalizien. [Report from E. Galicia.] *Verh. k.-k. geol. Reichs.* no. 11. pp. 188, 189.

Notes of fieldwork done in the summer of 1877.

Tombeck, —. Note sur le Corallien de la Haute-Marne. [Corallian of Haute-Marne.] *Bull. Soc. Géol. France*, sér. 3, t. v. pp. 24–31.

Shows (with reference to M. de Tribolet's recent researches) that whilst the newly created *Rauracian* stage may be admitted, it must yet be made to include the *Ammonites bimammatus* and *A. Marantianus* zones, and all the remaining L. Corallian. G. A. L.

——. Note sur une Faille de la côte Noeulon, à Vouécourt (Haute-Marne). [Fault near Vouécourt.] *Bull. Soc. Géol. France*, sér. 3, t. v. pp. 114, 115.

Calls attention to an illustration of the fact that a dislocation may have been in action at various times.

——. Note sur la position probable de la zône à *Ammonites tenuilobatus* dans la Haute-Marne. [Probable Position of the *A. tenuilobatus* Zone in Haute-Marne.] *Bull. Soc. Géol. France*, sér. 3, t. v. pp. 304, 305.

Fresh observations tend to show that possibly the zone in question, in Haute-Marne and Aube, merges to some extent into that of *A. bimammatus*. G. A. L.

Torell, Prof. Otto. Underdånig berättelse om en på nådig befallning år 1875 företagen undersökning af Malmfyndigheter inom Gellivare och Jukkasjärvi socknar af Norrbottens län. [Report on the Iron- and Copper-ore Districts of Lapland, in Sweden.] Pp. 144; 2 woodcuts, 5 maps. 4to. *Stockholm.*

After some official letters and notes as to the plan and supposed use of a proposed exploration of the districts, a short report is given on the principal results of the exploration made in 1875. Then follow the detailed reports from the members of the expedition. **D. Hummel** (pp. 30–42) describes the geological condition of the country. **O. Gumælius** (pp. 43–86) gives an account of the iron mountains, Gellivare, Kirunavara, Luosavara, &c., and of some copper-ore deposits. **A. O. Srysén** (pp. 87–110) describes the Laplandian copper-ore deposits from his own observations and from earlier notes. The report of **C. A. Dellvik** (pp. 111–128) contains an account of the chemical and metallurgic properties of the ores, &c., after which is a list of analyses of 41 iron-ores. The Maps are:—Geological maps of the Norrbotten district and of the Alpine regions between Gellivare and Torneträsk; maps of the iron-ore district of Gellivare, with equidistant curves; of the iron-ore mountains Kirunavara and Luosavara; and of Svappavara and Särkivara ore districts. The iron-ore mountains of Lapland are inexhaustible treasuries. The ores, both magnetic and red iron-ore, occur in layers from 180 to 780 Swedish feet thick, and are followed to 14,000 feet in length. In some places the ore contains apatite. None of all the rich ore-deposits are at present worked. There is a French *résumé*. E. E.

Törnebohm, A. E. Om sandstensbäckenet i Gestrikland. [The Sandstone Basin in Gestrikland province, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 412–420; plate (geol. map).

The sandstone, probably Silurian or perhaps partly Cambrian, alternates with beds of diabase. The formations are Silurian limestone, Sandstone, Primitive rocks, Olivine-diabase, and amygdaloid diabase. E. E.

——. [Description of the Geological Map of the Filipstad Iron-ore District, Vermland, Sweden.] Pp. 23. 8vo. *Stockholm.* See *post* under Maps (Filipstad).

Törnquist, S. L. Nyblottad geologisk profil med Phyllograptus skiffer i Dalarne. [Geological Section with *Phyllograptus*-schist in Dalarne, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 241–245, woodcut.

Shows porphyry and Silurian beds of green limestone, red schistose marl, red and grey Orthoceras-limestone. In layers of green schist, in the green limestone, are found *Phyllograptus*, *Didymograptus*, and *Tetragraptus*. E. E.

Toula, Franz. [On Greywacke of N. Alps.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 644–648.

Notes the occurrence of a few L. Coal Measure plants at Klamm. Near the Semmering Pass *Pentacrinus* occurs in limestone; by following this band a locality of numerous Rhætic fossils was found. E. B. T.

——. Geologische Untersuchungen im westlichen Theile des Balkan und in den angrenzenden Gebieten. [Geological Investigations in the W. Balkans.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Bd. lxxv. pp. 57–72, 113–144, plate and 4 cuts. (See Geological Record for 1876, p. 117.)

Part 2. Barometrical Observations for determining the heights of places visited. Part 3. Sarmatian deposits between R. Timok and Danube. The Mediterranean stage is absent in this district, though present at Plevna in nearly horizontal lie below the Sarmatians of Nicopolis. Several fossiliferous sections are described. The following species are new:—*Turbo Barboti*, *Polystomella Midhati* (Karrer, *in lit.*), *Cardium Timokii*, *Lepralia orthostichia*, *L. dichotomia*. E. B. T.

——. Ein geologisches Profil von Osmanich am Arčer über den Sveti Nikola-Balkan, nach Ak-Palanka an der Nišava. [Geological Section in the W. Balkans.] *Anz. k. Ak. Wiss.* Jahrg. xiv. pp. 109–111.

Metamorphic, Permian, Triassic, Jurassic, and Cretaceous rocks occur. Several of the fossils found are new species (not described).

Tournouër, —. Sur la Faune tongrienne des Déserts, près Chambéry (Savoie). [Tongrian Fauna of Les Déserts, near Chambéry, Savoy.] *Bull. Soc. Géol. France,* sér. 3, t. v. pp. 333–336.

This Tongrian has a southern facies, and is more closely allied to that of Gaas than to that of Délémont and Porrentruy.

Trautschold, H. Der russische Jura. [Russian Jurassic Beds.] *N. Jahrb.* Heft v. pp. 474–482.

Reply to a criticism of Prof. Neumayr. A comparison of the Jurassic fossils of Russia with those of W. Europe leads to the following correlation :—Sandstone of Gschel = Bath oolite ; clays of Metkomelina and Tschulkowa = Kelloway ; clay of Mjatschkowa = Lower Oxford ; clay of Mniowniki = Upper Oxford ; sand of Mniowniki = Kimeridge ; marl of Charaschowo = Portland. The Greensand overlying the *Aucella*-beds of Charoschowo are Neocomian. Defends his determination of certain species, and criticises Neumayr's palæontology. F. W. R.

Tribolet, M. de. [Equivalents of the Hanover Jura.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 843–845.

Compares the Hanover section with that of the Swiss Jura.

Uzielli, Gust. Sopra la lettera del Signor Carlo De Stefani, intitolata "L'Oligisto e gli altri minerali che si trovano al Capo Calafuria." [Oligiste, &c. of Cape Calafuria.] *Boll. R. Com. geol. Ital.* viii. pp. 137–141.

A defence of views previously expressed. (See Geological Record, for 1876, p. 245.)

Vacek, M. Ueber das Kreidegebiet in Vorarlberg. [The Cretaceous Rocks in the Vorarlberg.] *Verh. k.-k. geol. Reichs.* no. 7, pp. 117, 118.

Explanation of the geological map of the district (zone 16, col. i. and ii.).

Vacek, —. I Sette Comuni nel Veneto. *Boll. R. Com. geol. Ital.* viii. pp. 430–433. Translated from *Verh. k.-k. geol. Reichs.* no. 12.

Vallée-Poussin, Prof. C. de la. Note sur un Coupe du Terrain Dévonien mise à jour à la nouvelle route de Haillot à Andenelle. [Devonian Section on road from Haillot to Andenelle, Belgium.] *Ann. Soc. Sci. Brux.* ann. i., *Mémoires,* pp. 193–200.

Notes the discovery of beds with calcareous nodules in the schists, the characters of which call to mind, on a small scale, the cornstones in the Old Red of Shropshire, &c. The Devonian of Belgium unites in one basin the two facies which always occur separately in the British Isles, the Devonian (with calcareous beds and marine fossils) and the

Old Red (almost wholly quartz-schistose). On the S. border of the N. coal-basin the Eifelian is almost reduced to the upper beds, with *Stromatopora*, as is often the case on the N. border also. A. R.

Vanden Broeck, Ernest. Sur quelques points de la géologie des environs de Bruxelles. [Geology of Brussels.] *Ann. Soc. Géol. Nord*, t. iv. pp. 106–122.

Further explanations on some points in a former communication which had received adverse criticism. First he discusses the alterations to which sandy deposits are subjected by the percolation of carbonated waters, and especially draws attention to the false appearances of unconformity which this action may produce. The second question is the position of the Chamois Sands. Thirdly, discusses the relations of the Paniselian and the Bruxellian deposits, and maintains the existence of the Senne Valley fault. A. J. J-B.

——. Sur les altérations des dépôts quaternaires par les agents atmosphériques. [Subaërial Alteration of Quaternary Deposits.] *Compt. Rend.* t. lxxxiv. pp. 43, 44.

The red Drift of the Paris Basin is the grey Drift deprived of its calcareous matter and oxidized.

——. Note sur les Foraminifères de l'Argile des Polders. [Foraminifera of the Polders Clay.] *Ann. Soc. Belg. Micr.* t. iii.

Describes the geological structure of this recent deposit, giving a list of Foraminifera.

Vasseur, G., et L. Carez. Sur un nouveau facies des Marnes à *Limnæa strigosa* observé à Essones près Corbeil. [New Facies of the *L. strigosa* Marls at Essones, near Corbeil.] *Bull. Soc. Géol. France*, sér. 3, t. v. pp. 277–281, woodcut.

Describe some new sections in clay-pits.

——, ——. Sur les marnes suprà-gypseuses de Ville-Parisis. [Supra-gypseous Marls of Ville-Parisis.] *Bull. Soc. Géol. France*, sér. 3, t. v. pp. 312, 313.

Give comparative sections of the white and green marls at that place and at Romainville.

Verri, A. Alcune linee sulla Val di Chiana e luoghi adiacenti nella storia della terra. [Remarks on the Chiana Valley.] Pp. 100, geol. map. 8vo. *Pavia.*

Eocene, Miocene, Pliocene, and Recent beds, with volcanic rocks, serpentine, alabaster, hydraulic limes, gypsum, lignite, sulphur, cinnabar, antimony, and manganese occur in the district. W. H. D.

Vidal, L. M. Nota acerca del sistema Cretáceo de los Pirineos de Cataluña. [Cretaceous System of the Catalonian Pyrenees.] *Bol. Com. map. geol. Españ.* t. iv. pp. 257–373; many sections, 7 pls. of fossils.

An account is given of the area covered by the Cretaceous rocks, which are divided, on palæontological grounds, into Upper and Lower; the upper being subdivided into 5 groups, the lower into 2. These are compared with the Cretaceous rocks of other parts of Spain and of France. A list is given of 172 fossils from the Cretaceous rocks, among which the following new species are described and figured—*Chama Coquandi*, *C. Gasoli*, *Monopleura Fulgasi*, *M. figolina*, *M. Montsecana*, *M. minuta*, *Requienia Moroi*, *Hippurites Montsecanus*, *H. Maestrei*, *Radiolites Fumanyæ*, *R. Moroi*, *R. Osensis*, *R. angulosus*, D'Orb., var. *Ibericus*, *R. laciniatus*, *Sphærulites Aagerensis*, *S. pulchellus*, *S. planicostatus*, *S. minor*, *S. posæ*. J. F.

Vincent, G. Description de la Faune de l'Étage Landénien Inférieur de la Belgique. [L. Landenian Fauna of Belgium.] *Ann. Soc. Mal. Belg.* t. xii.

Report by Th. Lefèvre, giving list of fossils.

Viollet-le-Duc, —. Mont Blanc. Translated by — **Bucknall.** (See notice of the original in the GEOLOGICAL RECORD for 1876, p. 120.)

Watebled, Lieut. Coquilles fossiles recueillies à Capticux. *Compt. Rend. Soc. Linn. Bord.* t. xxxi. pp. xii, xiii, xx.

Lists of fossils collected on the left bank of the Gouaneyre, at Captieux.

——. Coquilles fossiles recueillies au Château d'Olivier. [Fossil Shells found at the Chateau d'Olivier.] *Compt. Rend. Soc. Linn. Bord.* t. xxxi. pp. lxi, lxii.

Websky, —. [Antimony-glance.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 425–6.

Note on veins in Amphibole schists at Heinrichsheim, Bohemia, containing the above mineral in quartz. The veins die out in the mica-schist to the S.E. E. B. T.

Werweke, Leop. van. Bemerkungen zur geologischer Karte von Luxemburg des Herrn N. Wies. [On Wies's Map of Luxemburg.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 743–750.

Indicates errors. From the terms "brown" and "white" Jura not being used in the ordinary technical sense, confusion arises. Keuper beds have been included in the Muschelkalk by neglecting the faults, &c. E. B. T.

Wies, N. (and others). Guide de la Carte Géologique du Grand-Duché de Luxembourg. [Guide to the Geological Map of Luxemburg.] Pp. 96; 3 pls. (Published by the Royal Society of Natural Sciences.) 8vo. *Luxemburg.*

Wiik, F. J. Öfversigt af Finlands geologiska förhållanden. II. Orografi och geogeni. [Review of the Geological Conditions of Finland.] *Bidrag till kännedomen om Finlands natur och folk*, häft 26, pp. 1–89. 8vo. Geol. sketch-map of S. and Central Finland. Scale 1 : 2,250,000. *Helsingfors.*

Williams, W. M. Through Norway with Ladies. Pp. xvi, 380. Map and 30 woodcuts. 8vo. *London.*

Geology of Stavanger, pp. 5, 6. A Short Essay on Glaciers, pp. 19–36. Notes the absence of moraines in Arctic Norway, the evidences of great glaciation, &c., pp. 37–39, 47–54. Notes on the Seven Sisters, Plains of Till at Bodö, limits of ancient glaciation, &c., pp. 64–80. Glaciation at Tromsö, pp. 101, 102. Moraine at Oxfjord, p. 103. Arctic headlands, banks of Till, pp. 137–141. Raised beaches in the Malangerfjord, p. 164. Glacier striation, &c., pp. 218, 219. The Dovrefjeld, Origin of Till, Glacier gravel, pp. 225–242. Miniature glaciers, p. 253. Coal-formation now in Progress, pp. 314, 315. Fillefjeld, Causes of Glacial Epochs, pp. 322–326. Glaciation of the Christiania Fjord, pp. 350–352. H. B. W.

Wimmer, —. Vorkommen und Gewinnung der Rammelsberger Erze. [Mode of Occurrence and Working of the Rammelsberg Ores.] *Zeitsch. Berg- Hütt. Salinenw.* Bd. xxv., *Abhandlungen*, pp. 119–131, pls. *c*, *d* (geological map and sections).

The pyritic mass of the Rammelsberg occurs in the Wissenbach Devonian schists, which, by a local inversion, due to extreme folding, seem to overlie higher members of the same series. The deposit is actually a bed whose apparent thickness is, in places, increased by contortion from its real thickness (50–70 feet) to 100 feet and upwards. The ore is an intimate mixture of iron- and copper-pyrites with a little blende and galena, and is worked for copper, lead, silver, and gold, as well as sulphur and vitriol. H. B.

Wolf, H. Der Bergsturz von Steinbrück. [Steinbrück Landslip.] *Verh. k.-k. geol. Reichs.* no. 3, pp. 51, 52.

Account of the slips of 15 and 18 January 1877. The materials of the fallen mass are marl, coal (lignite), sand, and sandstone, with a base of clay. G. A. L.

——. Aufnahmen in Oesterreichisch-Podolien. [Surveys in Austrian Podolia.] *Verh. k.-k. geol. Reichs.* no. 8, p. 137.

Announcement of a geological map in which 13 divisions will be shown.

Württenberger, —. [Goslar Coral Rag.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 832–835.

Gives a section near Goslar, and would keep the coral-bed in the Corallian.

Wyley, Andrew. The Iron Industries of Upper Austria. *Proc. Dudley Geol. Soc.* vol. 3, no. 3, pp. 45–47.

Notices the structure of the Styrian and Noric Alps, and describes the mode of reduction of iron-ores, giving statistics of production.

Zeiller, R. Détermination des Étages Houillers à l'aide de la Flore fossile. Résumé des travaux de M. Grand'Eury. [Correlation of Coal Measure Subdivisions by the Flora.] *Ann. Mines*, sér. 7, t. xii. p. 341–391.

Z[ezi], P. Cenno intorno ai lavori del Comitato Geologico nel 1876. [Work of Geological Commission in 1876.] *Boll. R. Com. geol. Ital.* viii. pp. 3–7.

Notice of maps in progress, memoirs published, &c.

Zittel, [Prof. K. A.] Ueber den Fund eines Skeletes von Archæopteryx im lithographischen Schiefer von Solenhofen. [Skeleton of Archæopteryx in Solenhofen Slate.] *Sitz. k.-bay. Ak. Wiss.* Bd. vii. pp. 155, 156.

Note of occurrence.

Zuarznavar, Mariano. Datos geologico-mineros de la Provincia de Burgos. [Mineral Geology of the Province of Burgos.] *Bol. Com. map. geol. Españ.* t. iv. p. 383, 384.

An account of a salt mine, with gypsum, in Jurassic rocks, as determined by the fossils. It was formerly worked more than now.

See also:—

Anon. *Ætosaurus ferratus*, Stuttgart (geol. remarks): *post*, VERTEBRATA.

Linnarsson, G. Paradoxides-beds in Öland: *post*, under INVERTEBRATA.

SUPPLEMENT FOR 1874–1876.

Alexandre, A. P. La Craie de Saint Maurice. [Chalk of St. Maurice.] *Bull. Soc. Linn. N. France*, t. ii. p. 87. [1874.]

Ammon, L. von. Die Juraablagerungen zwischen Regensburg und Passau. [Jurassic Beds between Ratisbon and Passau.] *Abh. zool.-min. Ver. Regensb.* Heft ii.; 4 pls. [1875?] See GEOLOGICAL RECORD for 1875, p. 47.

Anon. Geology of the Neighbourhood of Brussels. *Coll. Guard.* vol. xxxii. p. 413. [1876.]

A notice of papers by Rutot and Vanden Broeck at the Congress of confederated scientific bodies of Belgium.

Araus, F. G. Datos geologico-mineros sobre algunos grupos de minas del distritto de Madrid. [Mines of Madrid District.] *Boll. Com. map. geol. Españ.* vol. i. p. 285. [1874.]

Baretti, Dr. Notice géologique et minéralogique. [Geology and Mineralogy of the Valley of Aosta.] In 'Guide de la Vallée d'Aoste.' *Turin.* [1876.]

Barrois, Dr. C. [Marine Fossils in Carboniferous Rocks at Auchy-au-Bois.] *Ann. Soc. Géol. Nord,* t. i. pp. 55, 56. [1874.]

Bauza, Felipe. Breve Reseña Geologica de las Provincias de Tarragona y Lérida. [Geology of Tarragona and Lerida.] *Boll. Com. map. geol. Españ.* t. iii. pp. 115–123. [1876.]

In Tarragona occur U. Silurian, Triassic, Jurassic, Cretaceous, Eocene, Miocene, Pliocene, Recent, and Igneous Rocks, with silver and lead ores. In Lerida there is a like series without Pliocene and with Carboniferous. W. H. D.

Besnou, —. Considérations pratiques sur divers produits sous-marins, tangues, mielles et sables coquilliers, etc. [Practical Notes on some Marine Deposits.] 8vo. *Caen.* [1876.]

Bogaert, —. Notice sur le Terrain houillier du Limbourg Néerlandais. [Coal Measures of Dutch Limbourg.] *Ann. Mines,* sér. 7, t. x. pp. 429–437, pls. viii., ix. [1876.]

Gives details of researches for coal since 1857, describing and tabulating the results of various borings. Little or no concordance exists between the rocks recently found and those previously known in the Wurm basin; and the coal is inferior. J. S. D.

Cagnant, —. Note sur un important gisement de Kaolin situé dans le département de la Mayenne, à Saint-Beaudelle. [Kaolin in Mayenne.] *Compt. Rend.* t. lxxxii. p. 635. [1876.]

Cigalla, J. de. Sur un soulèvement sous-marin observé dans le golfe d'Arta. [Submarine Rising in the Gulf of Arta.] *Compt. Rend.* lxxxiii. pp. 534, 535. [1876.]

——. Sur l'état actuel des phénomènes volcaniques de Carvasserà. [Volcanic Phenomena at Carvasserà.] *Compt. Rend.* t. lxxxiii. p. 1005. [1876.]

Ciofalo, V. Su di un lembo fossilifero del Cretaceo medio. [Section in M. Cretaceous.] *Riv. Sci. Ind.* Feb. 1874.

——. Notizie sul terreno oligoceno dei dintorni di Termini. [Oligocene of Termini.] *Riv. Sci. Ind.* Feb. 1874.

Clessin, C. Der Ampergletscher. [Amper Glacier.] *Corr.-Blatt min.-zool. Ver. Regensb.* Jahrg. 29, pp. 25–32, 50–60. [1875.]

Clessin, S. Die fossile Molluskenfauna des Ammersees. [Fossil Mollusca of the Ammersee.] *Corr.-Blatt zool.-min. Ver. Regensb.* Jahrg. 28, pp. 186–190. [1874.]

——. Die Thalbildung in den Alpen. [Valley-formation in the Alps.] *Corr.-Blatt zool.-min. Ver. Regensb.* Jahrg. 30, pp. 35–44, 51–59. [1876.]

Cortazar, D. Reseña fisica y geologica de la region norte de la Provincia de Almeria. [Geology of N. Almeria.] *Bol. Com. map. geol. Españ.* t. ii. pp. 161–234, pl. A (map). [1875.]

Treats of the orography, agricultural state, stratigraphy, and mineralogy of the district. Trias, Lias, L. Jurassic, Eocene, Miocene, Pliocene, Post-Pliocene, and Eruptive rocks are present, with ores of copper, iron, and lead. Lists of fossils are given. W. H. D.

Cossigny, C. de. Sur les Puits naturels de Carnières. [Natural Wells of Carnières.] *Bull. Soc. Géol. France*, sér. 3, t. ii. pp. 630–638. [1876.]

These "wells" are cylindrical masses of sand occurring in the sand-formation of Carnières, but distinct from it. They are supposed to be due to undermining by underground waters, and consequent descent of a column of the overlying material altered by percolation of surface-waters. W. H. D.

Davila, F. M. Pozo Artesiano de la Plaza de la Victoria de Málaga. [Artesian Well in Malaga.] *Bol. Com. map. geol. Españ.* t. iii. pp. 133–136. [1876.]

In Pliocene or U. Miocene Clays.

——. Isla de Alboran. Datos Fisico-geológicos. *Boll. Com. map. geol. Españ.* t. iii. pp. 177–179. [1876.]

Guano, marls, &c. are noticed.

Dawkins, Prof. W. B. Die Höhlen und die Ureinwohner Europas. [Caves and Cave-dwellers of Europe.] Translated from the English by **Dr. J. W. Sprengel**, with a Preface by **Dr. O. Fraas.** [1875 ?]

Delfortrie, E. Nouveaux documents sur l'affaissement des côtes de Gascogne, données certaines fournissant la mesure du dénivellement qui s'est produit depuis 1770 à ce jour. [Subsidence in Gascony.] *Act. Soc. Linn. Bordeaux*, sér. 4, t. i. pp. 79–89. [1876.]

Adduces evidence, from old charts and documents, of the subsidence of the coasts of Gascony, and estimates it at 30 millimetres a year since 1788. W. G.

Delitsch, Dr. O. Aus den französischen Gebirgen. 2. Von Murat nach Clermont Ferrand. [French Mountains. From Murat to Clermont Ferrand.] *Aus allen Welttheilen*, September 1874, pp. 380–382.

Contains some descriptive geology.

De Man, J. C. Beenderen van den Mammouth en van het uitgestorven rund opgevischt in den omtrek van Zeeland. [Mammoth dredged up off Zealand.] *Arch. Med. Zeeland*, deel iii. pt. 2, pp. 101–127. [1875 or 1876.]

Remains of Mammoth and Bos, from the S. coast of Walcheren.

Dölter, Dr. C. Die Gesteine der Cicera bei Verespatak. *Verh. k.-k. geol. Reichs.* p. 42. [1874.]

——. Trachitvorkommen in Syrmien. *Ibid.* p. 60. [1874.]

——. Das Porphyrterrain im Fleimserthale. [Porphyry of the Fleimser Valley.] *Verh. k.-k. geol. Reichs.* p. 150. [1876.]

Ébray, Th. Stratigraphie du Mont Salève. *Bull. Soc. Géol. France,* sér. 3, t. iv. pp. 460–469. [1876.]

Describes the position of the beds (Miocene, Urgonian, Neocomian, and Corallian), and the faults affecting them.

Egozcue, J. Nota acerca de la Constitucion Geognostica del Suelo de Arnedillo, y Explicacion de un Accidente que se supuso Volcanico ocurrido en los dias 1 y 2 de Abril de 1875. [Geology of Arnedillo, and Explanation of a supposed Volcanic Event.] *Boll. Com. map. geol. Españ.* t. ii. pp. 241–268. [1875.]

Falsan, A. L'histoire géologique des Environs de Lyon étudiée dans les galeries du Musée d'Histoire Naturelle du Palais Saint-Pierre. [Geology of Lyons.] Rapport à M. le Préfet sur les travaux exécutés pendant l'année 1873. Pp. 33. [1874.]

Feistmantel, Karl. Zum Trilobitenfunde bei Přibram. [Trilobites at Pribram.] *Verh. k.-k. geol. Reichs.* pp. 162-165. [1876.]

——. Geognostische Beobachtungen. [Geological Notes.] *Lotos.* [1876.]

Flamant, —. Profil Géologique du Canal de Roubaix. [Geological Section of the Roubaix Canal.] *Mém. Soc. Sci. Agr. Arts Lille,* sér. 4, t. ii. [1876.]

Fontannes, F. Études stratigraphiques et paléontologiques pour servir à l'Histoire de la Période tertiaire dans le Bassin du Rhône. [Tertiary Period of the Rhone Basin.] 8vo. *Lyons* and *Paris.* I. Le Vallon de la Fuly et les Sables à Buccins des Environs d'Heyrien (Isère). [Valley of Fuly and Buccinum Sands of Heyrien.] 2 pls. Price 3½ francs. [1875.]

——. Ditto. II. Les Terrains tertiaires supérieurs du Haut Comtat-Venaissin Bolline.—Saint Paul Trois Châteaux.—Visan. [U. Tertiaries of Haut Comtat-Venaissin, etc.] Pp. v, 99; 2 pls. (sections). [1876.] Price 5 francs.

Notices previous observations. Gives details of 7 sets of sections, with lists of fossils. Classifies the beds under 2 heads, the Visan group, with 7 divisions, and the St. Arie's group, with 3 divisions; and describes each division, noting the fossils found. Gives the general conclusions arrived at. Describes the following new species and varieties of fossils [figured in Part iii., 1878]:—*Scalpellum Burdigalense,* D'Orb.,

var. *robusta*; *Pollicipes cornucopia*, Leach, var. *Abollensis*; *Turritella valriacensis*, *Fissurella Lugdunensis*, *Patella Tournoueri*, *P. delphinensis*, *P. Vindascina*, *Hydrobia Avisanensis*, *Limnæa Heriacensis*, *Auricula Abollenensis*, *Pecten comitatus*, *P. Cavarum*, *P. Davidi*, *Modiola Matheroni*, *Corbula Escoffieræ*, *Eugeniacrinus Rhodanicus*. W. W.

Fontannes, F. Note sur une coupe de l'Infra-Lias du Narcel (Mont-d'or, Lyonnais). Note sur la coupe de la gare de Saint Paul, à Lyon. [Section in L. Lias, Narcel. Railway-section, Lyons.] Price 1½ franc. [1874.]

Fouqué, —. Recherches minéralogiques et géologiques sur les laves des dykes de Théra. [Lavas of Santorin.] *Compt. Rend.* t. lxxxiii. pp. 878–884. [1876.]

Summary by MM. Chasles, Sainte-Claire Deville, Des Cloiseaux, and Daubrée giving the leading facts of arrangement and petrological characters of the acid and basic lavas. The memoir will be published elsewhere. W. H. D.

François, J. Le Caucase et ses eaux minérales. [The Caucasus and its Mineral Waters.] *Compt. Rend.* t. lxxxii. pp. 1245–1248. [1876.]

Brief geological notes.

Gamper, J. Diluviale Wirbelthierreste vom Gahnsgebirge bei Gloggnitz. [Vertebrata in Drift of L. Austria.] *Verh. k.-k. geol. Reichs.* p. 353. [1876.]

Notes the discovery of a block of bone-breccia.

Garcia, Manuel. Nota acerca de algunos Filones Estanniferos de la Provincia de Salamanca. [Tin-veins of Salamanca.] *Bol. Com. map. geol. Españ.* t. iii. pp. 91–95. [1876.]

Gascue, Francisco. Observaciones sobre una parte del Trias de la Provincia de Santander. [Trias of Santander.] *Bol. Com. map. geol. Españ.* t. ii. pp. 377–389, pl. D (map). [1875].

The Keuper, with lignite and rock-salt, rests on the Bunter. Analysis of the salt gives Na Cl 95·86 per cent.

Gastaldi, Prof. B. Sui fossili del calcare dolomitico di Chaberton (Alpi Cozie) studiati da G. Michelotti. [Chaberton Dolomitic Limestone Fossils.] *Atti R. Ac. Linc.* ser. 2, vol. iii. [1876]. See GEOLOGICAL RECORD, for 1876, p. 66.

Gaudry, A. Sur les gisements de fossiles quaternaires dans la Mayenne. [Quaternary Fossils, Mayenne.] *Compt. Rend.* t. lxxxiii. pp. 1211, 1212. [1876.]

Section and notes of fauna of Glacial beds.

Gosselet, Prof. J. Aperçu d'un travail . . . . . sur les terrains primaires du Boulonnais. *Ann. Soc. Géol. Nord,* t. i. p. 18. [1874?]

Gosselet, Prof. J. Esquisse Géologique du Département du Nord et des contrées voisines. Fasc. 2. [Geology of N. France.] *Bull. Sci. Hist. Lett. Nord.* From reprint paged 109–215. [1873–1876.]
Describes the Secondary and Tertiary rocks in detail (Neocomian and Miocene wanting). The fauna, lithology, range, contemporaneous and subsequent oscillations, &c. are noted. W. H. D.

——. Compte rendu de l'excursion . . . . . . [Excursion in the Avesnes, September 1874.] *Bull. Soc. Géol. France,* sér. 3, t. ii. pp. 663–687, 690–695, pl. xviii. [1876.]
Ferrières le grand, Limont, and Saint Remy Chaussée (Eocene, Cretaceous, Carboniferous, and Devonian), pp. 663–670. Avesnes and Etrœungt (Carboniferous Limestone), pp. 670–680. Trélon (Tertiary, Cretaceous, and Devonian), pp. 681–687. Fourmies, Anor, and Mondrepuits (L. Devonian), pp. 690–695. W. H. D.

Grand, Albert. The Coal Basin of the Asturias. *Coll. Guard.* vol. xxxii. pp. 13, 51, 91, 134, 171, 211, 251, 291, 331, 371. Translated from the Proceedings of the French Society of Civil Engineers. [1876.]
Gives a detailed description of the geological formation of the Asturian Coal Basin, and particularly refers to the iron-ores of the district, giving analyses. Describes the method of working coal and iron. J. S. D.

Gruner, L. Sur les causes qui ont amené le retrait des Glaciers dans les Alpes. [Causes of Retreat of Alpine Glaciers.] *Compt. Rend.* t. lxxxii. p. 632. [1876.]

Harting, —. Le Système Eémien. *Arch. Néerl.* t. xi. [1876.]

Helmersen, G. von. Bericht über die in den Jahren 1872 bis 1876 in den Gouvernements Grodno in Curland ausgeführten geologischen Untersuchungen zur Kenntniss der dort vorkommenden mineralischen Brennstoffe. [Researches in 1872–76 for Mineral Fuel in Courland.] 8vo. *St. Petersburg.* [1876.]

Helmhacker, R. Die Permmulde bei Budweis. [Permian of Budweis.] *Berg- Hutt. Jahrb.* Bd. xxii. Heft 1, p. 98. [1874.]

Héna, T. Les blocs et les cailloux roulés de grès rouges du drift de Saint Brieuc. [Red Sandstone Blocks in Drift.] *Compt. Rend.* t. lxxviii. pp. 752, 753. [1874.]
Note of boulders of non-local rock.

Hoernes, Dr. R. Vorlage von Petrefakten des Bellerophonkalkes aus Süd-Ost-Tyrol. [Bellerophon Limestone of S.E. Tyrol.] *Verh. k.-k. geol. Reichs.* pp. 38–44. [1876.]

Hoernes, Dr. R. Petrefacte des obersten Jura (Tithon- und Acanthicus-Schichten) vom Monte Lavarelle bei St. Cassian in Süd-Tirol. Eingesendet durch Herrn Prof. Dr. A. v. Klipstein. [U. Jurassic of S. Tyrol.] *Verh. k.-k. geol. Reichs.* pp. 129–131. [1876.]

——. Aufnahmen in der Umgebung von Serravalle, Longarone und Feltre. [Notes in N. Italy.] *Verh. k.-k. geol. Reichs.* pp. 297–299. [1876.]

Issel, A. Malta. Residuo di una gran terra sommersa. Schizzo geologico. [Malta. The Remains of a Great Submerged Land.] *Genoa.* [1874.]

Jeanbernat and **Timbal-Lagrave.** Massif du Laurenti, canton de Quérigut (Ariège). Exploration botanique et géologique du dit massif, avec une carte de la région du Laurenti. [Geology of the Laurenti 'Massif,' Ariège.] *Bull. Soc. Sci. Phys. Nat. Toulouse* for 1875–6, livr. 2; map.

Krenner, —. A Dobsinai Jégbarlang. [Ice-cave of Dobschau.] Pp. 26; 6 pls. 4to. *Budapest.* [1874.]

Labat, —. Note sur l'origine des eaux de Recoaro (Italie). [Origin of Waters of Recoaro, Vicentin.] *Bull. Soc. Géol. France,* sér. 3, t. iv. pp. 443–446. [1876.]

The country consists of Jurassic and Triassic rocks based on gneiss, &c., and traversed by dykes of porphyry and dolerite. The springs are cold carbonated chalybeates, with sulphates and carbonates of lime and magnesia. W. H. D.

Lapparent, A. de. Sur l'Aachénien. *Bull. Soc. Géol. France,* sér. 3, t. ii. pp. 688, 689. [1876.]

Regards the Aachenian, from its lithological and palæontological characters, as equivalent to the Sables de Bray and Wealden.

Lasala, José G. Areniscas Bituminosas ó Petroliferas del Puerto del Escudo en los Confines de las Provincias de Santander y Burgos. [Bituminous or Petroleum-Sandstones of Santander and Burgos.] *Bol. Com. map. geol. Españ.* t. iii. pp. 235–241. [1876.]

The sandstones are Neocomian. Analyses, by **A. Maestre,** of surface marls and of the petroleum are given.

Lennier, —. La géologie pittoresque des Côtes de la Manche. [Picturesque Geology of the Channel Coast.] [1875.]

Comprises the sections from La Hève to Antifer, from Villerville to Bénerville, and from Villers to Dives. (Noticed in *Bull. Soc. Géol. Norm.* iii. 15.) W. W.

Leymerie, A. Notes sur l'Existence du Mercure coulant dans les Cevennes. [Native Mercury in the Cevennes.] *Mém. Ac. Toulouse,*

ser. 7, t. viii. p. 341 [1876], and *Compt. Rend.* t. lxxxii. p. 1418 [1876].
Confirms the statement of M. Thomas (see below).

Leymerie, Prof. A. Nota acerca del Garumnense español. [Note on the Garumnian in Spain.] *Bol. Com. map. geol. Españ.* t. iii. pp. 347–352. [1876.] See GEOLOGICAL RECORD for 1875, p. 87.

Lóczy, Lajos. [U. Mediterranean Beds of the White Körös Valley.] *Földt. Közl.* t. v. p. 1.

——. Jelentes a Hegyes-Drocsahegységben tett Földtani kirándulásokról. [Important Geological Facts on the Hegyes-Drosca Mts.] 8vo. *Budapest.* [1876.]

Mercey, N. de. Sur la classification de la période quaternaire en Picardie. [Classification of Quaternary in Picardy.] *Mém. Soc. Linn. N. France,* t. iv. p. 18. [1874?]

——. [Geology of Amiens.] To notice of this in GEOLOGICAL RECORD for 1875, p. 83, add no. 40, p. 332, and in that for 1876, p. 94, add no. 47, p. 67.

Meugy, —, and — Nivoit. Sur la Carte agronomique de l'arrondissement de Rethel (Ardennes). [Geology of Rethel.] *Compt. Rend.* t. lxxxiii. pp. 352–354. [1876.]
Describes M. and U. Jurassic, Cretaceous, Tertiary, and Quaternary rocks.

Naranjo, —. Datos geologico-mineros Provincia de Jaen, termino de la Carolina. [Geology of Jaen.] *Bol. Com. map. geol. Españ.* t. ii. pp. 235–240. [1875.]
Granite, Silurian, Tertiary, and Recent beds are present. Argentiferous galena and chalybeate springs occur.

Noulet, —. Note sur un gisement du *Canis palæolicus* dans le Miocène Toulousain. [Bed with Fossil Dog in the Toulouse Miocene.] *Mém. Ac. Toulouse,* sér. 7, t. viii. p. 400. [1876.]

——. Note sur un gisement nouveau du *Cadurcotherium Cayluxi.* *Ibid.* p. 404. [1876.]

Olszewski, Dr. Stanislaw. Rys geologiczny polnocno wschodniej czesci Podola austryjackiego. [Geology of N.E. Austrian Podolia.] *Sprawozd. Kom. Fizyj. Krakow.* t. x. pp. 115–160. [1876.]
Chiefly on the palæontology of the Miocene and Pliocene beds, with lists of fossils.

Oriol y Vidal, Roman. Descripcion Geológico-Industrial de la Cuenca Hullera del Rio Carrion en la Provincia de Paleneia. [Geology of the Palencia Coal-field.] *Bol. Com. map. geol. Españ.* t. iii. pp. 137–168, pl. A (map). [1876.]

Describes the Drift, Eocene, Cretaceous, and Carboniferous rocks. About Muñeca the Cretaceous lies beneath the Coal Measures, and these dip under the Millstone Grit and Carboniferous Limestone. In other places the beds, with Devonian below, occur in their normal position, but undulating and highly inclined. The history of the mining, statistics of quantity and quality (rough analyses and commercial details) are added. W. H. D.

Orueta, Domingo de. Bosquejo geológico de la parte Sud-Oeste de la provincia de Málaga. [Geology of S.W. Malaga.] *Malaga.* [1875.]

Parran, —. Nota sobre la Geología de la Cuenca de Belmez. [Geology of the Belmez District.] *Bol. Com. map. geol. Españ.* t. iii. pp. 169-175. [1876.] Translated from *Bull. Soc. Géol. France*, sér. 2, t. xxviii. p. 15, by **L. M[allada]**.

The Belmez coal-field is subdivided by parallel ranges of Carboniferous Limestone. The Coal Measures are in 3 groups—"Terrible," "Cabeza de Vaca," and "Guddiato y la Ballesta." W. H. D.

Paul, C. M., and Dr. E. Tietze. Bericht über bisher in diesem Sommer ausgeführte Untersuchungen in den Karpathen. [Researches in the Carpathians.] *Verh. k.-k. geol. Reichs.* pp. 294-297. [1876.]

Pery, G. A. Geographia e Estatistica Geral de Portugal e Colonias. Pp. xvi, 405; 8 plates, geological map (scale 1:500,000). 8vo. *Lisbon.* [1875.]

Part I. Physical Geography (pp. 1-62). Chap. ii. Mountains and Valleys; iii. River Basins; v. Agriculture; vi. Geology; vii. Mineral Waters, with analyses. The Atlantic islands and the colonies are described in pp. 285-396. W. T.

Popovics, Prof. A. B. Jelentes a Frusca Gora Hegysegben tett geologiai gyüjtés-es Kutatásról.—I rész. Eruptiv Közetek. [Important Geological Facts on the Frusca Gora Mountains.—Part I. Eruptive Rocks.] *Jahrb. kön.-ung. geol. Anst.* [1876.]

Ribeiro, —. Descripção de alguns silex e quartzites lascados, encontrados nas camadas dos terrenos terciario e quaternario das bacias do Tejo e Sado. [Flints and Quartzites in the Tertiary and Quaternary Beds of Tejo and Sado.] *Mém. Ac. Sci. Lisb.* t. v. pl. i. [1875.]

Robert, É. Sur les gisements d'ossements fossiles de Pargny Filain et de Sezanne. [Beds with Fossil Bones, France.] *Compt. Rend.* t. lxxxiii. pp. 1250, 1251. [1876.]

Deposits of bones in the Calcaire Grossier and in the Calcaire Pisolithique de Meudon.

Rochat, J. L. [The "Bonds" of the Plain of Bière, Vaud.] *Gazette de Lausanne*, Nov. 24, 1875.

Rossi, Prof. M. S. de. Bullettino del vulcanismo italiano. Periodico geologico ed archeologico. [Italian Vulcanicity.] Anno ii. 1875, anno iii. 1876. *Rome.* [1875.]

Sampayo, Pedro. Datos Geologico-mineros de la Provincia de Burgos. [Geology and Mineralogy of Burgos.] *Bol. Com. map. geol. Españ.* t. iii. pp. 125–132. [1876.]

Notes on coal and lignite (Carboniferous, Cretaceous, and Tertiary), galena, copper-ore, manganese, iron-ore, and sulphate of soda.

Schlüter, C. Über das Vorkommen von unterem Lias an der preussisch-holländischen Grenze. Über die Auffindung tertiärer Schichten über der westfälischen Steinkohlenformation. [L. Lias on German-Dutch Border; Tertiaries upon Westphalian Coal Measures.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. i., *Sitzungsb.* pp. 229–231. [1874.]

Schmid, Dr. E. E. Der Muschelkalk des östlichen Thüringens. [E. Thuringian Muschelkalk.] Pp. 20. 8vo. *Jena.* [1876.]

Describes L. and M. Muschelkalk, giving lists of fossils; *Rhizocorallium commune* being new.

Suszycky, Z. Poklady siarki, oleju i wosku ziemnego w Dzwiniacu, tudziez: Ogólny poglad na pochodzenie oleju ziemnego. [Deposits of Sulphur, Petroleum, and Ozokerite at Dzwiniacz (S. of Stanislaw), with Remarks on the Origin of Petroleum.] *Sprawozd. kom. Fizyjogr. Krakow*, t. x. pp. 171–179. [1876.]

Describes the mode of occurrence of these minerals in Cretaceous or Tertiary rocks. Regards the sulphur as due to the action of hydrocarbons on gypsum. W. H. D.

Taramelli, Prof. T. Appunti sulla storia geologica del Margraviato d'Istria. [Geological Notes on Istria.] *Atti R. Ist. Ven. Sci.* ser. iv. vol. iii. plate. [1874.]

Thomas, N. Sur l'existence du mercure à l'état de minerai dans le département de l'Hérault. [Native Mercury in Hérault.] *Compt. Rend.* t. lxxxiii. p. 1111. [1876.]

Tischler, O. Bohrungen in der Provinz Preussen betreffen. [Borings in Prussia.] *Schrift. phys.-ökon. Ges. Königsberg*, Jahrg. 17, *Sitzungsb.* p. 19. [1876.]

——. Ueber die neuesten Entdeckungen in der Diluvialfauna Ostpreussens. [Latest Discoveries of E. Prussian Drift-Fauna.] *Schrift. phys.-ökon. Ges. Königsberg*, Jahrg, 17, *Sitzungsb.* p. 22. [1876.]

Tournouër, —. Sur les fossiles miocènes de Cabrières d'Aigues et du Mont Léberon (département de Vaucluse). [Miocene Fossils

of Vaucluse.] *Bull. Soc. Géol. France*, sér. 3, t. ii. pp. 128–133. [1874.]
General remarks as to the age of the deposits, as shown by the fossils.

Tournouër, —. [Nummulitic Fossils from Biarritz.] *Bull. Soc. Géol. France*, sér. 3, t. ii. pp. 262, 263. [1874.]

Tribes, Dr. E. Études sur des ossements fossiles trouvés à Saint-Laurent-des-Arbres (Gard), et sur la nature du terrain de leur gisement. [Fossil Bones in the Gard, and the Deposit in which they were found.] 8vo (pamphlet). *Nismes.* [1876.]

Tribolet, M. de. Sur le véritable Horizon Stratigraphique de l'Astartien dans le Jura. [True Position of the Astartian.] *Mém. Soc. Emul. Doubs.* [1875.]
The Astartian separates the *Pterocerasbeds*- from the *Nerinæa*-beds.

Urbanek, —. Spatheisensteinvorkommen im Syenit bei Brunn. [Iron Ore in Syenite of Brunn.] *Verh. nat. Ver. Brunn*, Bd. xiii. p. 35. [1875.]

Vasseur, G., and L. Carez. Coupe géologique de la terrasse de la Seine à La Frette, près Cormeilles-en-Parisis (Seine-et-Oise). [Section of the Bank of the Seine at La Frette.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 471–477, pl. xiv. (large folding section). [1876.]
Detailed section of Eocene beds.

Vézian, A. Le Jura franc-comtois. Études géologiques sur le Jura, considéré principalement dans la partie nord-occidentale. [N.W. Jura.] Pt. 2. 8vo. *Paris.* [1876.]

Vion, R. Les Tourbières. [Peat-bogs.] *Bull. Soc. Linn. N. France*, t. ii. p. 175. [1874.]

Volger, —. Ueber das Strontian-Vorkommen in Westphalen. [Occurrence of Strontianite in Westphalia.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. i., *Corr-Blatt*, pp. 98, 99. [1874.]

Wolf, H. Die Gebiete am Gnieszna und Gnila-Bache und am Zbrucz (Galicia). *Verh. k.-k. geol. Reichs.* pp. 299-301. [1876.]

Zareczny, Dr. Stanislaw. Dodatek do fauny warstw tytonskich w Rogozniku i w Maruszynie. [Tithonian Fauna of Rogoznik and Maruszynia.] *Sprawozd. kom. Fisyjogr. Krakow*, t. x. pp. 180–219, pl. i. [1876.]
Remarks on the rocks of the district (Keuper to Tithonian), with a list of 123 fossils from the last. The new species *Pleurotomaria Zeuschneri*, *P. turrita*, *Phyllocrinus elegans*, *P. stellaris*, and *P. minutus*, besides a few previously known, are described and figured. W. H. D.

Zsigmondy, B. [Artesian Well at Rank-Herlány, Hungary.]. *Berg-, Hütt. Zeit.* Bd. xxxv. Abstract in *Proc. Inst. Civ. Eng.* vol. xlvii. pp. 357–359. [1876.]
Boring for mineral waters; section of beds to 1457 feet.

Obeyasnitelinaya zapiska ke plastovoi gorno-promitchlennoi karte ce vertikalinime razrézome zapadnoi tchasti Donetchkago kamenno-ygolinago kryaja. [Explanatory Notice of the Mining Map, with a Vertical Section of the W. Part, of the Donetz Coal-field.] Pp. 112. 8vo. *Taganrog.* [1876.]

See also:—

Favre, E. Zone of *Ammonites acanthicus* in the Alps: *post,* under INVERTEBRATA.

Filhol, H. Phosphorites of Quercy: *post,* under VERTEBRATA.

Krause, A. Limestone of N. German Drift: *post,* under INVERTEBRATA.

Stache, Dr. G. Bellerophon Limestone of S. Tyrol: *post,* under INVERTEBRATA.

3. *ARCTIC REGIONS.*

Sub-Editor G. A. Lebour, F.G.S.

Helland, Amund. On the Ice-fjords of North Greenland, and on the formation of Fjords, Lakes, and Cirques in Norway and Greenland. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 142–176.

Describes the inland sea of Greenland; gives observations on the rate of flow of glaciers from it, and a description of the formation of icebergs. There are many marks of the former extension of glaciers to a great depth. The cirques of Norway and Greenland are described; they occur at about the level of the snow-line, and are most numerous where the valleys face N. The opinion of Lieut. Lorange is adopted, that these hollows were made by the incessant freezing and thawing of the water beneath the glacier, the rocks thus being loosened and split, and then removed by the glacier-flow. Details of the lakes of Norway are given, and of their relation to glacier-marks. The fjords, as well as the lakes, are thought to be due to the excavating power of glaciers, acting in previously formed valleys. F. D.

Markham, Capt. A. H. Our Life in the Arctic Regions. *Good Words*, Feb., pp. 137–144.

The geological formation on either side of Smith Sound seems to be the same; but the stratification on the E. is regular and horizontal, whilst on the W. it is much distorted, the dip varying from 10° to 45°. The land on the E. side seems to have undergone a steady upheaval; that on the W. to have been raised suddenly. R. E., Jun.

Nordenskiöld, Prof. A. E. [Notes on the Inland Ice of Greenland.] *Compt. Rend.* t. lxxxv. p. 61.

Extract from a letter accompanying photographs of geological interest.

——. [Report of Expedition to the Jenissei.] *Göteborgs Handels Tidning*, Oct. 24, 1876. Abstract translation in *Nature*, vol. xv. pp. 123–125.

Describes 6 raised beaches in Nova Zembla, highest 600 feet above the sea-level. The banks of the Jenissei consist of sand and mud 100 feet thick, with sea-shells of recent species, the top layer forming the rolling plains of tundra, in which were found bones of musk-ox and hide of mammoth. C. E. R.

Steenstrup, K. J. V. Indberetning om de i Grönland 1876 foretagne geologiske Undersögelser. [Report of the Geological Explorations in Greenland, 1876.] *Tillæg til Rigsdagstidenden* for 1877–78. *Kjöbenhavn.*

Wills, T. On the Arctic Coal brought home by the late Expedition. *Journ. Soc. Arts*, vol. xxv. no. 1298, pp. 988, 989, and *Coll. Guard.* vol. xxxiv. p. 619. [Brit. Assoc.]

The coal was found inland near Discovery Bay, in the side of a gorge; a thickness of 25 feet is shown, the base not being seen. It is overlain by shale with Miocene plants, and is a bituminous coal, not a lignite. An analysis is given. W. W.

See also:—

Torell, Prof. O.: p. 130.

4. *AMERICA.*

Sub-Editor G. A. Lebour, F.G.S.

Abbott, Dr. C. C. [Flint Chips? in Gravel.] 10 *Ann. Rep. Peabody Mus.* vol. ii.

Describes the occurrence in undisturbed, partly stratified gravel, near Trenton, New Jersey, of what appear to be flint chippings. Regards the gravel as Glacial, and the relics as those of Glacial Man. (From notice in *Amer. Journ.*) W. H. D.

Anderson, A. D. The Silver Country, or the Great South-west. A Review of the Mineral and other wealth, the attractions and material development of the former kingdom of New Spain, comprising Mexico and the Mexican Cessions to the United States in 1848 and 1853. Pp. 221; map. 8vo. *New York.* Price 2 dollars.

Refers to Texas, California, New Mexico, Nevada, Arizona, and Utah. Gives statistics of production.

Anon. [**H.**] Explorations made, under the direction of F. V. Hayden, in 1876. *Amer. Journ.* ser. 3, vol. xiii. pp. 68–74.

Notices the districts examined by the various parties. Intrusive trachytes occur in 5 isolated groups in E. Utah. Eocene *Unios* (3 new sp.) closely represent living species. No physical or palæontological break occurs from the Cretaceous to the M. Tertiary (Bridger group). W. H. D.

——. Large Bowlders in New Hampshire. *Daily Monitor, Concord, N. H.* Oct. 15; and *Amer. Journ.* ser. 3, vol. xiv. p. 495.

Notes 13 boulders, each of 40,000 to 70,000 cubic feet.

——. The Coal Fields of Alabama, U. S. *Coll. Guard.* vol. xxxiv. p. 104.

Alludes to the Warrior coal-fields, with a bed of coal averaging about 30 in. and within 50 feet from the surface.

——. The Mineral Resources of Missouri. *West. Rev. Sci. Ind.* vol. i. pp. 144–147.

——. A Fourth Oil Rock. *West. Rev. Sci. Ind.* vol. i. p. 491.

Notes an oil-bearing sand, at 1645 feet, at Big Shanty, S. of Bradford, Missouri.

Anon. The Wonderful Fossil Beds of Oregon. *West. Rev. Sci. Ind.* vol. i. pp. 608–610, from *Eugene City (Oregon) Guardian.*

Describes a deposit in Lake County, very rich in vertebrate remains.

——. [**R. W.**] The Colorado Mud Volcanos. *Land and Water,* vol. xxiv. p. 335.

The Æolian Drift is described, also the mud-cones, the volcanoes, and the course of the new river, the latter having suddenly appeared, and nearly as suddenly disappeared. G. H. K.

——. The San Juan Guide. 8 pp.; map. Fol. *Topeka, Kansas.*

Gives an account of the district, with especial reference to its mineral resources. Gives weights per cubic foot, and specific gravity of the common minerals, and a synopsis of the ores of gold and silver. G. A. L.

——. [**R. B.**] [?**R. Brown.**] Coal Fields of Nova Scotia. *Nature,* vol. xv. pp. 488, 489.

Corrects Dr. Siemens's statement as to the area and yield.

Baird, Prof. S. F. Annual Review of Science and Industry for 1876. Pp. 839. 8vo. *New York.*

Contains geological matter relating to America.

Baucher, W. [Stump of Oak 5 feet deep in Prairie Soil, Oregon, Mo.] *West. Rev. Sci. Ind.* vol. i. p. 509.

Broadhead, Prof. G. C. Thickness of the Missouri Coal Measures. *West. Rev. Sci. Ind.* vol. i. pp. 392, 393.

Broja, —. Der Anthracitbergbau in den Vereinigten Staaten Nord-Amerikas. [Mining of Anthracite in the United States.] *Zeitschr. Berg-, Hütt. Salinenw.* Bd. xxv. *Abhandlungen,* pp. 39–57.

The method of working anthracite in Pennsylvania is described and illustrated, mostly from American sources; the earlier pages contain estimates of the area and generalized sections of the seams. H. B.

Burwash, Rev. John. Geology of the Site of the Belleveau Mining Operations. *Trans. Nov. Scot. Inst.* vol. iv. pt. iii. pp. 309–311.

The chief rocks are shales and conglomerates, the relative position of which is hard to determine.

Calvin, Prof. S. On the Occurrence of the Marcellus Shales in Iowa. *Nature,* vol. xv. p. 303.

Carll, J. F. Oil Well Records and Levels. *2nd Geological Survey of Pennsylvania.* Pp. 348. 8vo. *Harrisburg.*

States positions and depths, and often gives sections, of 2000 wells in W. Pennsylvania.

Case, Col. T. S. The Wyandotte (Kansas) Gas Well. *West. Rev. Sci. Ind.* vol. i. pp. 321–324.

Mentions various gas-springs, and gives a letter from **N. McAlpin** describing the Wyandotte gas, and section of bore-hole, 581 feet.

Case, Col. T. S. The Mineral Region of South-west Missouri and South-east Kansas. *West. Rev. Sci. Ind.* vol. i. pp. 385–391.

Describes the coal, lead, and zinc deposits, giving 2 woodcut sections.

Chamberlain, Prof. T. C. Report of the Geological Survey of Wisconsin, vol. ii. for 1873–1877. Pp. 768; woodcuts, lithographs, and maps in text; 37 pls. 8vo; folio Atlas of 14 maps.

Contains **Dr. I. A. Lapham's** reports for 1873 and 1874, and **Dr. O. W. White's** for 1875; **Prof. Chamberlain's** report on the Geology of Eastern Wisconsin, 310 pp.; **Prof. R. D. Irving's** report on the Geology of Western Wisconsin, 235 pp.; and **Prof. M. Strong's** report on the Geology and Topography of the Lead Region, 110 pp. W. H. D.

Claypole, E. W. On the Pre-glacial Geography of the Region of the Great Lakes. *Canad. Nat.* n. ser. vol. viii. no. 4, pp. 187–206. (*Cincinnati Nat. Hist. Soc.* Jan. 1875.)

An argument in favour of the Great American Lakes having been excavated by the slow action of a river during part or the whole of the Secondary and Tertiary periods. There is no evidence that they originated from the effects of local glaciers or a continental ice-sheet. R. B. N.

Cook, G. H. Geological Survey of New Jersey. *Annual Report of the State Geologist for the year* 1877. Pp. 56, map (Glacial Drift). 8vo. *Trenton.*

Exploration of the portion of New Jersey which is covered by the Glacial Drift (with directions of glacial markings), pp. 9–22. Examination of the Deposits of Shell Marl in Sussex and Warren Counties (with 14 analyses), pp. 22–30. Miscellaneous Laboratory Work (analyses of ores, waters, &c.), pp. 48–54. W. W.

Cope, Prof. E. D. Report on the Geology of the Region of the Judith River, Montana, and on Vertebrate Fossils obtained on or near the Missouri River. *Bull. U.S. Geol. Surv. Terr.* vol. iii. no. 3, pp. 565–597, pls. 30–34.

Describes the Judith River formation, the new species *Elasmosaurus serpentinus*, Niobrara, and *Pelycorapis berycinus*, Fort Pierre Beds, and some Dinosaurian bones from Judith River Beds. W. H. D.

Crosby, W. O. Notes on the Surface-geology of Eastern Massachusetts. *Amer. Nat.* vol. xi. pp. 578–587.

Deals with the surface-features, chiefly in so far as these are referable to glacial action.

Dana, Prof. J. D. Note on the Glacial era. *Amer. Journ.* ser. 3, vol. xiii. pp. 79, 80.

Prof. Torell misunderstood him as referring the glaciation of E. America to a Canadian source.

Dana, Prof. J. D. An account of the Discoveries in Vermont Geology of the Rev. Augustus Wing. *Amer. Journ.* ser. 3, vol. xiii. pp. 332–347 (map), 405–419, and vol. xiv. pp. 36, 37 (map).

Geological details from notebook and letters of the late Mr. Wing of the S. part of Vermont, consisting of Silurian rocks; the Eolian Limestone is shown to include limestones of various ages, from the U. Potsdam to the Trenton group; the Red Sandrock and Quartzyte are Potsdam, and the slates of the Central Belt are Hudson River Beds. W. H. D.

——. On the relations of the Geology of Vermont to that of Berkshire. *Amer. Journ.* ser. 3, vol. xiv. pp. 37–48, 132–139, 202–207, 257–264.

The series (Silurian) is the same in both areas; but the Berkshire rocks are more metamorphosed.

——. Note on the Helderberg Formation of Bernardston, Massachusetts, and Vernon, Vermont. *Amer. Journ.* ser. 3, vol. xiv. pp. 379–387.

The series of quartzite, limestone, mica-slate, and gneiss is conformable throughout, and of Helderberg (U. Silurian) age. Analyses of biotite and hornblende are given. W. H. D.

Dawson, G. M. Mesozoic Volcanic Rocks of British Columbia and Chile. Relation of Volcanic and Metamorphic Rocks. *Geol. Mag.* dec. ii. vol. iv. pp. 314–317.

The Porphyrite series of British Columbia and Chile consists of volcanic sedimentary rocks of ages between Jurassic and Cretaceous, which slight metamorphosis has converted into crystalline rock. The British L. Silurian and the Huronian of Canada are referred to as other examples. W. H. D.

——. Note on some of the more recent changes in level of the coast of British Columbia and adjacent regions. *Canad. Nat.* n. ser. vol. viii. no. 4, pp. 241–248.

Remarks on the former levels of the coast. Gives the following provisional conclusions:—*Miocene Period:* immediately succeeding considerable mountain upheaval, and closed by basalt flows of the interior; coast, at least during part of this period, somewhat lower than at present. *Pliocene Period:* land elevated at least 900 feet above the present sea-line, for part or the whole of this period. *Glacial Period:* at one or more epochs land much depressed, at one time probably over 5000 feet. The country considerably below the present level when the glacier of the Strait of Georgia finally retreated from the S.E. part of Vancouver Island. *Post-glacial and Modern:* re-elevation to a height probably 200 or 300 feet greater than at present, followed by depression to near the present level. Rapid depression of perhaps 10 or 15 feet during the latter part of last century, a movement, probably, slowly going on. R. B. N.

Dawson, G. M. General note on the Mines and Minerals of Economic value of British Columbia, with a list of localities, reprinted with additions and alterations from the *Canadian Pacific Report.* Pp. 47.

The various matters of interest with regard to the statistics, methods of working, localities, &c. of the different mineral products are given under the following heads:—gold; coal and lignite-bearing formation (analyses of coals given); iron, silver, copper, mercury, and other ores; building and ornamental stones. Gives a list of the localities in British Columbia known to yield gold, coal, iron, silver, copper, and other minerals of economic value. E. T. N.

Diller, J. S. Westfield during the Champlain Period. *Amer. Journ.* ser. 3, vol. xiii. pp. 262–265, map, in text.

Westfield (Massachusetts) is on a river flowing across a N. and S. valley lying between the Divide Range and the Tekoa Hills. During the Champlain Period that river and its tributaries ran down the valley from N. to S., instead of transversely, as at present. G. A. L.

Dodge, Lt.-Col. R. T. The Hunting Grounds of the Great West . . . 8vo. *London.*

Chap. i. General description, pp. 1–18, has geological notes. Chap. ii. Surface, pp. 19–37.

✓ **Emmons, S. F.** The Volcanoes of the United-States Pacific Coast. *Bull. Amer. Geogr. Soc.* no. 4, pp. 31.

Describes the volcanic belt of California, &c., with a special account of Mono Lake, Lassen's Peak, and Mts. Shasta and Rainier.

Fontaine, W. M. Notes on the Vespertine Strata of Virginia and West Virginia. *Amer. Journ.* ser. 3, vol. xiii. pp. 37–48, 115–123.

The series thickens in a marked manner S., and the amount of coal in it increases. "This increase seems to be largely at the expense of the supposed Catskill Beds. It is in conformity with a law of increase, which holds good for all the strata from the Devonian to, and including, the Lower Barren Measures of the Upper Coals." G. A. L.

Frazer, Persifor, Jun. Report of Progress in the Counties of York Adams, Cumberland, and Franklin. *Geological Survey of Pennsylvania.* Pp. 400, maps and sections. 8vo. *Harrisburg.*

Describes the magnetic and micaceous ore-belt near the W. edge of the Mesozoic sandstone, the Dillsburg Ore-bed, and the two Azoic systems of the South Mountains. (From notice in *Amer. Journ.*) W. H. D.

Gage, J. R. The Ste. Genevieve County Copper Mines. *West. Rev. Sci. Ind.* vol. i. pp. 603–605.

The ores occur in three or four beds intercalated in U. Silurian rocks, and consist of carbonates, sulphides, and oxides.

Goodyear, W. A. The Coal Mines of the Western Coast of the United States. Pp. 154. 12mo. *San Francisco.*

Describes the coal-fields of California, Oregon, and Washington Territory; none older than Cretaceous.

Hall, Prof. James. The Louisville Limestones. Advance sheets, pp. 139–154, of the *Palæontology of New York*, vol. v. pt. ii.

Note on the Hydraulic Beds and associated Limestones at the Falls of the Ohio, pp. 139–147. Describes the U. Helderberg group, giving a list of species from the Devonian at the Falls of the Ohio.

Note on the Black Slate succeeding the Hamilton Limestones at the Falls of the Ohio, pp. 148–154. Traces the changes of the Hamilton group, and shows that the Black Slate belongs to it, and is the Genesee Slate. W. H. D.

Hayden, Dr. F. V. Ninth Annual Report of the United States Geological and Geographical Survey of the Territories, embracing Colorado and Parts of Adjacent Territories, . . . for the year 1875. Pp. vii, 827; 68 pls. (48 geological) and 7 maps (none geological). 8vo. *Washington.*

Dr. Hayden describes the mode of conducting the survey, and some of the principal results, pp. 1–28.

Dr. A. C. Peale reports on the Grand River division: Superficial, Archæan, Palæozoic, Mesozoic, and Igneous Rocks, Economic Geology, and list of minerals, pp. 33–101.

Dr. F. M. Endlich reports on the South-eastern division: Metamorphic, Silurian, Carboniferous, Mesozoic, Tertiary, and Volcanic Rocks and Drift. Quotes Dr. Loew's analyses of thermal waters, and gives analyses of all Colorado coals (by various authors), and a list of minerals, pp. 105–235.

W. H. Holmes reports on the San Juan District, consisting of Mesozoic and Tertiary and Igneous rock, pp. 241–276.

B. F. Mudge reports on Kansas (Tertiary and Cretaceous Rocks) [Reprinted with additions from the *Bulletin*: see GEOLOGICAL RECORD for 1876, p. 138.], pp. 277–294.

F. Rhoda, reporting on the topography of the South-eastern District, describes some " earth-pillars " on the Rio Grande, p. 311. W. H. D.

——. Preliminary Report on the Field Work of the U.S. Geological and Geographical Survey of the Territories, for the Season of 1877. Pp. 35. 8vo. *Washington.*

Summary of geological work in the Green River district, in the Sweetwater district, and in the Teton district; with the palæontological work in Colorado, Wyoming, and Utah. W. H. D.

——. Sketch of the Origin and Progress of the United States Geological and Geographical Survey of the Territories. Pp. 15. 8vo. *Washington.*

Contains a summary of the publications by the Department, including those in preparation, and a description of 6 views of ancient ruins in Colorado.

Hayden, Dr. F. V. Notes on some Artesian Borings along the Line of the Union Pacific Railroad in Wyoming Territory. *Bull. U.S. Geol. Surv. Terr.* vol. iii. no. 1, pp. 181–185, pl. 26 (sections).

Details of borings in Cretaceous and Tertiary beds, with notes on supply, &c.

Hind, H. Y. Notes on some Geological Features of the North Eastern Coast of Labrador. *Canad. Nat.* n. ser. vol. viii. no. 4, pp. 227–240; no. 5, pp. 262–278. See also *Nature,* vol. xvi. p. 52.

1. Area described. 2. Rock Cleavage. 3. Pan Ice. 4. Extent of Pan Ice Work. 5. Glacial Striæ and Glacial Clays. 6. Icebergs. 7. Formation of Boulder Clays. 8. The Marine Climate of the Labrador Coast. 9. The Crystalline Limestones of the Laurentian Series. Two sections given of the strata on the coast of Hamilton Inlet.

1. Symmetrical Structure of the Strata. 2. Concretionary Structure. 3. Boulders and outliers of the Upper Laurentian or Labrador series. 4. Permanent Snow Drifts. 5. Influence of Winds on the Composition of the Drifts. 6. Mechanical effects produced by Snow Drifts. 7. Amount of Snow Fall in North-Eastern America. 8. Direction and Force of the Winds. 9. Influence of Snow Drifts as Geological Agents. R. B. N.

Hinde, George Jennings. The Glacial and Interglacial Strata of Scarboro' Heights and other Localities near Toronto, Ontario. *Canad. Journ.* n. ser. vol. xv. pp. 388–413, plate.

Treats of the Glacial deposits of the north shore of Lake Ontario, and especially of the line of cliffs, nearly 10 miles long, known as Scarboro' Heights. Notices the fundamental rocks of the region, from which are derived the pebbles in the till, and describes the Glacial deposits as consisting of:—1. Till or boulder clay, resting on striated rocks, and containing striated and angular boulders, sometimes with "striated pavements." 2. Interglacial fossiliferous clays, and, 3, interglacial sands stratified, and containing many remains of land plants along with some freshwater shells. 4. Middle boulder-clay or till, resembling the lowest series in character. 5. Upper interglacial clays and sands stratified, but apparently without fossils. 6. Upper boulder-clay or till resembling the two lower ones. 7. Postglacial sands and gravels. The bearing of the facts discovered upon the history of events during the Glacial period in Canada is discussed at length, and various deductions drawn therefrom. H. A. N.

Hitchcock, Prof. C. H. The Geology of New Hampshire. A Report comprising the results of Explorations ordered by the Legislature.—Part II. Stratigraphical Geology. Pp. 684; 26 pls. and maps, illustrations, and sections. 4to. *Concord.*

The Relations of the Geology of New Hampshire to that of the adjacent territory, pp. 3–36, pls. i.–iv.

Geology of the Coös and Essex Topographical District, by **J. H. Huntington**, pp. 37–97, pls. v., vi.

Geology of the White Mountain District, pp. 98–270, pls. vii.–xii. (pp. 127–131, 148–151, by **J. H. Huntington**).

Geology of the Connecticut Valley District, by **C. H. Hitchcock**, pp. 271–465, pls. xiii.–xix. (pp. 408–427, by **J. H. Huntington**).

Geology of the Merrimack District, West Part (the Gneissic area from Landaff to the southern boundary of the State), by **J. H. Huntington**, pp. 466–517, pl. xx.

Geology of the Merrimack District, East Part, pp. 518–591, pls. xxi.–xxiv.

Geology of the Lake District, pp. 592–610.

Geology of the Coast District, pp. 611–633, pl. xxv.

Description of the General Sections, pp. 634–657.

Description of the New Hampshire Formations, pp. 658–675, pl. xxvi. R. B. N.

Hitchcock, Prof. C. H. Lenticular Hills of Glacial Drift. *Proc. Boston Soc. Nat. Hist.* vol. xix. pp. 63–67.

These accumulations of till occur unequally distributed over S. and E. New Hampshire and E. Massachusetts. Several of the localities are named. Their origin is due to glacial movements. R. B. N.

——. Geology of the White Mountains. *Appalachia*, vol. i. pp. 70–76.

Describes Laurentian, Montalban, Huronian, Coos, L. Helderberg, Glacial, and Eruptive rocks.

Honeyman, Rev. Dr. Nova Scotian Geology at the Centennial Exhibition—International Exhibition of 1876. *Trans. Nov. Scot. Inst.* vol. iv. pt. iii. pp. 252–260.

A lists of rocks, minerals, &c.

Hunt, Dr. T. S. On the History of the Crystalline Stratified Rocks. *Proc. Amer. Assoc.* vol. xxv. pp. 205–208. (Abstract.)

Refers to Laurentian, Norian, Huronian, Montalban, and Taconic rocks, constituting together the Eozoic epoch.

——. Geology of Eastern Pennsylvania. *Proc. Amer. Assoc.* vol. xxv. pp. 208–212.

Describes Laurentian, Montalban, Primal, and Auroral rocks.

——. The Quebec Group in Geology. *Proc. Boston Soc. Nat. Hist.* vol. xix. pp. 2–4. (Abstract.)

——. The Goderich Salt Region and Mr. Attrill's Exploration. *Trans. Amer. Inst. Min. Eng.* vol. v. 28 pp., and *Toronto Globe*, Jan. 9. See also *Amer. Journ.* ser. 3, vol. xiii. pp. 231, 232.

Details of boring, 1517 feet deep, through dolomitic marl with 6 beds of rock-salt, varying from 6 to 35 feet thick, in the Salina (U.

Silurian), at Goderich, on E. shore of L. Huron. Analysis of the salt by **Mr. Gould.** W. H. D.

Irving, Roland. Note on the Age of the Crystalline Rocks of Wisconsin. *Amer. Journ.* ser. 3, vol. xiii. pp. 307–309.

The crystalline rocks of Wisconsin consist of 3 groups:—Laurentian, on which comes unconformably Huronian; and the Copper Series, probably unconformable to the others. The Potsdam Sandstone overlies all unconformably.

Le Conte, [Prof.] Joseph. Hog Wallows or Prairie Mounds. *Nature*, vol. xv. pp. 530, 531.

Due to surface erosion in a bare country, when the drift soil is fine above, and generally coarse below.

Lesley, Prof. J. P. Oil Well Records, selected from the collections of **Mr. J. F. Carll** . . . . . . *Proc. Amer. Phil. Soc.* vol. xvi. no. 97, pp. 346–380.

Consists entirely of well-sections in Pennsylvania.

Lewis, Elias. Certain features of the Valleys or Water-courses of Southern Long Island. *Amer. Journ.* ser. 3, vol. xiii. pp. 215, 216.

The valleys are Postglacial, in Champlain gravels and sands; they are very numerous, none more than 10 miles long, seldom more than 20 feet deep, with very steep W. sides, and very gradual declivities on the E. banks. Their direction is a little W. of S. The cause is probably "the rotation of the earth upon its axis co-acting with the river current." G. A. L.

Lupton, Prof. [On the Water-supply of Nashville.] *Memorial Volume of the Nashville Meeting of the American Association for the Advancement of Science.*

Matzger, W. O. Fossil Elephant in Washington Territory. *Amer. Journ.* ser. 3, vol. xiii. p. 157.

Note of occurrence.

Milne, Prof. John. On the Rocks of Newfoundland. With Notes by **Alexander Murray.** *Geol. Mag.* dec. ii. vol. iv. pp. 251–262.

Describes Laurentian, Huronian, L. and U. Silurian, Devonian ?, and Carboniferous rocks, and refers to the Drift.

Morgan, C. L. The "Drift" of Brazil. *R. Sch. Mines Mag.* vol. ii. pp. 3–7.

Mosler, Chr. Der Kupferbergbau am Obern See in Nordamerika. [Copper Mines of Lake Superior.] *Zeitschr. Berg-, Hütt. Salinen.* Bd. xxv. *Abhandlungen*, pp. 203–221, pl. x (geological map).

Describes the mode of occurrence of native copper on Lake Superior, and discusses the possible geological age, the position, and phenomena observed at the different mines, and the methods of working. The details are mostly compiled from Pumpelly's Michigan State Report, and from American Memoirs. The copper is supposed to have been derived from the waste of deposits in the Huronian series. H. B.

Mudge, Prof. B. F. The Iola Gas Well. *Trans. Kansas Ac. Sci.* vol. v.

——. Annual Report of the Committee on Geology for the year ending November 1st, 1876. *Trans. Kansas Ac. Sci.* vol. v.

Packard, A. S., Jun. Glacial marks of the Pacific and Atlantic Coasts compared. *Amer. Nat.* vol. xi. pp. 674–680.

Describes the glacial phenomena observed in explorations along the Pacific coast, including a visit to Whitney glacier, on the flanks of Mount Shasta. H. A. N.

Peale, Dr. A. C. On a Peculiar Type of Eruptive Mountains in Colorado. *Bull. U.S. Geol. Surv. Terr.* vol. iii. no. 3, pp. 551–564.

Describes the most important masses of igneous rocks in Colorado, regarding them as fused sedimentary rocks forced through fractures during plication. W. H. D.

——. Notes on the Age of the Rocky Mountains in Colorado. *Amer. Journ.* ser. 3, vol. xiii. pp. 172–181.

Archæan land existed in Palæozoic times. This went on subsiding from the Carboniferous to the L. Tertiary; elevation recommenced in the Lignitic, and continued beyond the L. Miocene. W. H. D.

Phillips, J. V. C. Geology of the West. *St. Louis Republican* and *West. Rev. Sci. Ind.* vol. i. pp. 488–491.

Describes the section of the well of the Insane Asylum, St. Louis, 3800 feet in Carboniferous, Devonian, and Silurian rocks, and remarks on the denuding action of the Mississippi. W. H. D.

Platt, F. and W. G. Report of Progress in the Cambria and Somerset District of the Bituminous Coalfields.—Part 1. Cambria. *2nd Geological Survey of Pennsylvania*, pp. 194; 4 maps, &c.—Part II. Somerset, pp. 348; 6 maps and sections. 8vo. *Harrisburg.*

The preface, by Prof. J. P. Lesley, states that the Elk Lick Coal has no existence.

Platt, Franklin. Special Report on the Coke Manufacture of the Joughiogheny River Valley in Fayette and Westmoreland Counties, with geological notes on the Coal and Iron-ore beds. *Geographical Survey of Pennsylvania*, pp. 252, maps, &c. 8vo. *Harrisburg.*

A report on the use of natural gas in the Iron Manufacture, by **J. P. Pearse** and **F. Platt**, is appended.

Posepny, F. Geologisches aus dem Hochlande im Westen Nordamerika's. [Geological Notes from the W. highlands of N. America.] *Verh. k.-k. geol. Reichs.* p. 61.

Pošepny, F. Geologisches aus Utah. [Geological Notes from Utah.] *Verh. k.-k. geol. Reichs.* p. 102.

Pumpelly, Prof. R. Metasomatic Development of the Copper-bearing Rocks of Lake Superior. *Proc. Amer. Ac.* vol. xiii. p. 310.

✓ **Richter, —.** Mittheilungen über einige Zweige der Metall-, namentlich der Blei- und Silber-Industrie der Vereinigten Staaten von Nord-Amerika. [Lead and Silver Industry of the United States.] *Zeitschr. Berg-, Hütt. Salinenw.* Bd. xxv. *Abhandlungen*, pp. 77–118.

Describes the many processes adopted in California, Colorado, Nevada, and Utah, with sketches of the geology and mode of distribution of the ores. Most of the matter is compiled from Raymond's and other United States' Reports. H. B.

Roy, Alfred. Third Annual Report to the Governor of the State of Ohio, on the mineral resources. Noticed in *Mining Journal*, vol. xlvii. p. 4.

Safford, Prof. [On the Geology of Nashville.] *Memorial volume of the Nashville Meeting of the American Association for the Advancement of Scince.*

Saward, F. E. "The Coal Trade" . . . . Pp. iv. 84. 8vo. *New York.*

Chiefly refers to production, &c., but gives short notes of coal-fields, with woodcut-maps.

Selwyn, A. R. C. Geological Survey of Canada. *Report of Progress for* 1875–76. Pp. xxvii, 432; plates and maps. 8vo.

Summary Report of Geological Investigations, pp. 1–27.

On Exploration of British Columbia, pp. 28–86, map and illustrations. Treats of the geological features, and includes observations on the Economic Minerals. Appendix i. Geological and Topographical Notes by **Prof. Macoun** on the Lower Peace and Athabasca Rivers, pp. 87–95. Appendix ii. Notes by **F. J. Whiteaves** on some of the Fossils collected during the Expedition.

Report of **Prof. Macoun**, pp. 110–186, with a few geological notes.

On Explorations in British Columbia. By **G. M. Dawson.** Pp. 233–265, with illustrations and sections. The Geology is summarized under the headings:—Cascade Mountain Crystalline Series; Lower Cache Creek Group; Porphyrite Group; Jackass Mountain Group (L. Cretaceous). The Lignite Group (Tertiary) contains insect and plant remains at Quesnel: the plants are described by **Principal Dawson.** Basaltic series; Glaciation and Superficial Deposits. A section is given across the Fraser River Valley at Quesnel. Appendix: The Insects of the Tertiary Beds at Quesnel. By **S. H. Scudder.** Pp. 266–280. Describes two new genera of Hymenoptera, *Calyptites antediluvianum* and *Lithortalis picta* (Diptera).

On the Boring Operations in the North-West Territory, summer of 1875. By **R. W. Ells.** Pp. 281–291. Gives a section of the Drift beds passed through at Carleton: coal-seams on the Brazeau River.

Borings made on Swan River, near Fort Pelly. Pp. 292, 293.

On an Exploration in 1865 between James' Bay and Lakes Superior and Huron. By **Robert Bell.** Pp. 294–342. Describes the geological features of the routes from Lake Huron to James' Bay, and from the Long Portage, on the Mississippi, to Michipicoten, on Lake Superior. The fossils from Long Portage are described by **Mr. Whiteaves**; they belong to the Corniferous Limestone Group (Devonian). Treats also of the Drift, soil, &c.

Report of Progress in the Exploration and Survey of the Coal Fields of Cumberland County, Nova Scotia. By **Scott Barlow.** Pp. 343–347. Contains details of sections in the Springhill District.

Report of Geological Observations in Southern New Brunswick. By **Prof. L. W. Bailey, G. F. Matthew,** and **R. W. Ells.** Pp. 348–368. Describes the pre-Carboniferous Rocks of Queen's and Sunbury Counties under the divisions—Coldbrook Group (Huronian?), U. Silurian, and Devonian. Many sections given.

Report of Explorations and Surveys in Cape Breton, Nova Scotia, by **Hugh Fletcher,** pp. 369–418, sections; and Geological Map of the Sydney Coal Field, Breton, Nova Scotia, by **C. Robb** and **H. Fletcher.** The formations referred to, in ascending order, are:—Syenitic gneissoid and other felspathic rocks; George River Crystalline Limestone; L. Silurian; Carboniferous Conglomerate; Carboniferous Limestone; and Millstone Grit. The Superficial Geology and the Economic Minerals are described, analyses and sections being given.

Chemical Contributions to the Geology of Canada. By **Christian Hoffmann.** Pp. 419–432. Contains results obtained in the analysis of some Canadian minerals and rocks, comprising saline incrustations, fuels, and graphites, as also the results of the assay of some ores of gold, silver, copper, and iron. R. B. N.

Shaler, Prof. N. S. Notes on the Age and Structure of the several Mountain Axes in the Neighbourhood of Cumberland Gap. *Amer. Nat.* vol. xi. pp. 385–392.

An exposition of the author's views as to the mode of formation and date of certain of the ranges of the Appalachian system, with special reference to the evidences of recent action in the mountain-building forces in the region in question. H. A. N.

——. On the Existence of the Alleghany Division of the Appalachian Range within the Hudson Valley. *Amer. Nat.* vol. xi. pp. 627, 628.

Points out that the district between the Hudson River and the Catskill Mountains is affected by disturbances, which are really a northward extension of those which gave rise to the Alleghanies. H. A. N.

Simonds, Fred. W. The Geology of Ithaca, New York, and the Vicinity. *Amer. Nat.* vol. xi. pp. 49–51.

An account of the local geology of Ithaca and the shores of Lake Cayuga.

Smith, Dr. Eugene A. Geological Survey of Alabama. *Report of Progress for* 1876. Pp. 100, map. 8vo. *Montgomery, Ala.*

Describes in detail the structure of Roup's and Jones's Valleys (L. and U. Silurian, Devonian, and Carboniferous) and of the Coosa coalfield and adjacent formations (L. Silurian and L. Carboniferous), giving analyses, by **Drs. T. M. Drown** and **Otto Wuth, Profs. Rœpper** and **N. T. Lupton,** and **Messrs. J. B. Britton** and **A. W. Kinzie,** of 7 limonites, 10 hematites, and 2 limestones. The map includes parts of the Warrior, Cahaba, and Coosa coalfields. W. H. D.

Stevenson, Prof. J. J. Report of Progress in the Fayette and Westmoreland District of the Bituminous Coal Fields of Western Pennsylvania. *Second Geol. Survey of Pennsylvania.* Pp. 438, maps and sections. 8vo. *Harrisburg, Pa.*

Describes the geology of Eastern Alleghany, Fayette, and Westmoreland Counties, including part of the Pittsburgh Coalfield. Many analyses of coal and iron-ore are given. W. H. D.

——. On Dr. Peale's Notes on the Age of the Rocky Mountains in Colorado. *Amer. Journ.* ser. 3, vol. xiii. pp. 297–299.

Corrects four of Dr. Peale's statements (see p. 127).

Streng, A., and J. H. Kloos. Ueber die krystallinischen Gesteine von Minnesota in Nord-Amerika. [Crystalline Rocks of Minnesota.] *N. Jahrb.* Heft i. pp. 31–56; Heft ii. pp. 113–138; Heft iii. pp. 227–242; with woodcuts.

Describes a number of granitic, syenitic, and dioritic rocks from the Laurentian formation on the Upper Mississippi and on the Sauk River. Also porphyritic melaphyres and hornblendic gabbros from L. Superior, and melaphyr from the R. Ste. Croix between Minnesota and Wisconsin; these rocks may be referred to the close of the Huronian and beginning of the Silurian period. The specimens were collected by Kloos, who describes their mode of occurrence; while Streng describes their mineralogical, microscopic, and chemical characters, for which see *post*, PETROLOGY. F. W. R.

Sutton, George. Gravel deposits referred to the drift, in Boone County, Kentucky. *Proc. Amer. Assoc.* vol. xxv. p. 225.

Torell, Prof. Otto. On the causes of the Glacial Phenomena in the North-eastern portion of North America. Pp. 8, map. 8vo. *Bihang K. Svenska Vet.-Akad. Handl.* Bd. 5, no. 1, map.

Traces of the ice-age are found not only in Europe, but also in the United States and in the regions to the north. The greatest ice-field in Europe was that which originated in the highlands of Scandinavia, and extended over those parts of N. Europe known to be covered by

Scandinavian erratics. The Scandinavian glacier crossed the Baltic and the German Ocean, and extended its moraines to the suburbs of London on the W., to the slopes of Riesengebirge in the S.E., and to the Tscheskaia bay of the Icy Sea on the N.E. Many American geologists think that the source of the eastern ice-field in N. America is to be searched for in the Canadian highlands; but reasons may be urged against this; and it is assumed that Greenland was the source of the glacial phenomena of British America and of the N.E. parts of the United States. The map shows the extent of the Northern Drift, as well as the direction of the Glacial furrows in Europe and N. America. E. E.

Upham, Warren. Modified drift in New Hampshire. *Report of the Geology of New Hampshire*, vol. iii. pp. 176, map and sections. 8vo. *Concord, N. H.*

——. The Northern Part of the Connecticut Valley in the Champlain and Terrace Periods. *Amer. Journ.* ser. 3, vol. xiv. pp. 459–470.

In the Terrace Period the Postglacial Champlain Beds were eroded into terraces. Glacial, Postglacial, and Recent beds are described.

——. Notes on the Surface Geology of New Hampshire. *Canad. Nat.* n. ser. vol. viii. no. 6, pp. 325–336.

Treats of the glacial period, the boulder clay or lower till, the upper till, the Drift deposits, the origin of kames, and the recent or terrace bed. Mentions the clay deposits with marine shells near the coast and along Hudson River and Lake Champlain. These clays are probably equivalent to the *Leda* Clay. R. B. N.

——. Surface-Geology of the Merrimack Valley. *Amer. Nat.* vol. xi. pp. 524–589.

Deals with the surface configuration and glacial phenomena of the valley.

——. On the Origin of Kames or Eskers in New Hampshire. *Proc. Amer. Assoc.* vol. xxv.

Describes the kames and terraces of newer date.

Vennor, H. G. Archæan of Canada. *Amer. Journ.* ser. 3, vol. xiv. pp. 313–315.

An Azoic system of syenite and gneiss is covered unconformably by a series of gneiss, slate, limestone, graphitic and apatitic rocks = U. Laurentian. The lower part of the latter = Sir W. E. Logan's Huronian; the Eozoon limestone is in the upper part. W. H. D.

Virlet d'Aoust, —. Observations sur le système des montagnes d'Anahuac ou de l'Amérique centrale, sur la grande chaîne volcanique guatémalienne, sur les volcans de l'Amérique du Nord, sur l'origine des volcans. [Mountain Chains and Volcanoes of Central and North America, and Origin of Volcanos.] *Bull. Soc. Géogr. France*, sér. 6, t. xiii. p. 241.

Wallace, Alfred R. "The Hog-Wallows" of California. *Nature,* vol. xv. p. 431.

Quotes Prof. Joseph Le Conte.

West, E. P. Age of "Prehistoric" Remains found at Kansas City, and of the Races of Men Associated with Them. *West. Rev. Sci. Ind.* vol. i. pp. 193–199.

Describes the Bluff formation (Loess), containing implements.

West, H. H. Report of Discovery of Mastodon Tusk. *West. Rev. Sci. Ind.* vol. i. pp. 336, 337.

Section in Loess, Kansas City.

Wethered, E. The Mammoth Cave of Kentucky. *Proc. Bristol Nat. Soc.* n. ser. vol. ii. pt. 1, pp. 56–67, plate.

Describes the Cave, and its various chambers and galleries. The plate shows a view of the interior, and "Flower-like forms of Gypsum."

Wilkins, D. F. H. Notes upon the Occurrence of Eozoic Rocks in the South Riding of Hastings County, and in Prince Edward County, Ontario. *Canad. Nat.* n. ser. vol. viii. no. 5, pp. 278–282.

Describes the Eozoic Rocks near Phannonville in Hastings County, and in Ameliasburgh Township, Prince Edward County.

Winchell, Prof. N. H. The Geological and Natural History Survey of Minnesota. The Fifth Annual Report. For the Year 1876. Pp. 248; 5 maps (3 geological). 8vo. *St. Paul.*

Houston County (pp. 24–50) is wholly L. Silurian (Trenton Limestone down to Ste. Croix Sandstone), Drift, and Alluvium. Each subdivision is described, and the economic geology reported on. Palæontology (pp. 51–56), consists of lists of fossils from the Trenton group in Minnesota. Chemistry (pp. 57–63), by **Prof. S. F. Peckham,** gives analyses of 4 coals (and their ashes), a clay, limestone (St. Lawrence), and a mineral water. Hennepin County (pp. 143–201) is composed of L. Silurian (Trenton Limestone down to Shekapee Limestone), Drift, and Loess. Cretaceous rocks are suspected to occur under the Drift, which is very fully described. The economic geology is reported on, and an analysis by S. **D. Hayes** of an alkaline water is given. Museum Catalogue (rocks, minerals, and fossils mixed), pp. 202–229. W. H. D.

Wolf, Th. [Geology of Esmeraldas.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 412–415, woodcut.

In this province of Ecuador the author discovered platinum in the gravels, and the gold is said to be worth washing. Above the gold-bearing Drift is a considerable thickness of volcanic tuff in the valley of Rio Esmeraldas; above it river alluvium. E. B. T.

Wootten, J. E. A Combination of Apparatus by which ordinary Anthracite Coal-waste from the Dirt-banks at the Mines can be successfully and profitably burned in the Furnaces of Stationary and Locomotive Boilers. *Proc. Amer. Phil. Soc.* vol. xvi. pp. 214-217.

Contains a slight amount of geological matter regarding the seams of coal being interstratified with slate.

Wright, G. F. Gravel Ridges in the Merrimack Valley. *Proc. Boston Soc. Nat. Hist.*

Young, —. On Conglomerate No. XII. *Proc. Ac. Nat. Sci. Philadel.* for 1876, p. 262.

Describes the section on New River, West Virginia.

Zeballos, E. S. Estudio geologico sobre la provincia de Buenos Aires. [Geology of Buenos Ayres.] 8vo. *Buenos Ayres.*

See also :—

Ellis, W. H. California Borax District: *post*, MINERALOGY.

Miller, S. A. American Palæozoic Fossils (Introductory Chapter): *post*, INVERTEBRATA.

SUPPLEMENT FOR 1874–1876.

Avé-Lallemant. Apuntes sobre la geognosía de la Sierra de s. Luis. [Geology of the Sierra S. Luis.] *Act. Ac. Nac. Univ. Cordova*, t. i. [1875.]

Barrett, Dr. S. T. Notes upon the Lower Helderberg rocks of Port Jervis, N. Y. *Amer. Journ.* ser. 3, vol. xiii. pp. 385–387. Abridged from *Ann. Lyc. Nat. Hist. N. York*, vol. xi. [1876.] Title noted in the GEOLOGICAL RECORD for 1876, p. 128.

Section and lists of fossils, *Dalmannites micrurus* being new (described in the fuller paper).

Becker, Dr. G. P. Notes on a New Feature in the "Comstock Lode." *Amer. Journ.* ser. 3, vol. x. pp. 459–462. [1875.]

The vein is between syenite and a more recent propylite, extends downwards into syenite only, and ranges longitudinally into propylite only. W. H. D.

Bell, Robert. Sketch of the Geology of the Route of the Intercolonial Railway. *Canad. Journ.* ser. 2, vol. xv. pp. 381–387. [1876.]

Gives an account of the successive formations cut across by the Railway, ranging from the Quebec Group to the Trias.

Blandy, J. F. On Evidence of Streams during the Deposition of the Coal. *Trans. Amer. Inst. Min. Eng.* vol. iv. pp. 113-116, pl. i. [1876.]

Remarks on the difficulties of mining in the Upper Freeport seam, Pennsylvania. The coal is often cut out by "horsebacks," which follow a regular line, and are the filling-in of a streamway which existed during the deposition of the coal. The plate shows the course of the stream. R. B. N.

Brackebusch, —. Descripcion de las rocas de la Sierra de Córdova. [Rocks of the Sierra Cordova.] *Act. Ac. Nac. Univ. Cordova,* t. i. [1875.]

Burbank, L. S. Remarks on the Conglomerate of Harvard, Mass. *Proc. Boston Soc. Nat. Hist.* vol. xviii. pp. 224, 225. [1876.]

This conglomerate covers about 2 miles in length by 400 or 500 feet in width. It is associated with a soft argillaceous and chloritic slate.

Coryell, Martin. Diatomaceous Sands of Richmond, Virginia. *Trans. Amer. Inst. Min. Eng.* vol. iv. pp. 230–232, pl. v. [1876.]

The geological features of Richmond are briefly noticed. In excavating Church Hill Tunnel, through diatomaceous sand, fish remains (vertebræ, teeth, coprolites, &c.) were found, not interspersed with the material, but generally in pockets. The infusorial earth might serve for polishing or for the manufacture of dynamite. R. B. N.

Dana, Prof. J. D. On Southern New England during the melting of the Great Glacier.—Supplement. The Overflows of the flooded Connecticut. *Amer. Journ.* ser. 3, vol. x. pp. 497–508. [1875.]

Gives heights of water-levels, as shown by terraces of clay, sand, and gravel.

——. On Southern New England during the melting of the Great Glacier. *Amer. Journ.* ser. 3, vol. xii. pp. 125–128. [1876.]

Appendix. On the discharge of the flooded Mill River into the Quinnipiac, and the effects as registered in the drift deposits of the New Haven plain. Continuation: see GEOLOGICAL RECORD for 1875, p. 118, and for 1876, p. 131, and above. W. H. D.

Dawson, Principal J. W. Carboniferous Pulmonates. *Amer. Journ.* ser. 3, vol. xii. pp. 226, 227. [1876.]

Pupa vetusta and *Conulus priscus* from a higher horizon than previously known, in the South Joggins.

Denton, William. On an Asphalte Bed near Los Angeles, Cal., and its contained fossils. *Proc. Boston Soc. Nat. Hist.* vol. xviii. pp. 185, 186. [1876.]

The bed covers from 60 to 80 acres, and is over 30 feet deep. A Machairodus tooth, and teeth of the fossil horse, bones of the deer, a large bovine animal, the otter, seal, albatross, and other animals have been found in it. R. B. N.

Deville, C. Ste. C. The Guadeloupe Volcano. *L'Institut,* p. 328. [1875.]

Domeyko, Ignacio. Mémoire sur les Solfatares latérales des volcans dans la chaîne méridionale des Andes du Chili. [Lateral Solfataras of the Volcanoes of the S. Chilian Andes.] *Ann. Mines*, ser. 7, t. ix. pp. 145–189. [1876.]

Describes two classes of Solfataras observed in the Andes, and gives details and analyses of many igneous rocks of the locality.

——. Ensaye sobre los depositos metaliferos de Chile. [Metallic Deposits of Chile.] 8vo. *Santiago*. [1876.]

Engelmann, H. The Brown Coals of Utah and adjoining Territories. *Trans. Am. Inst. Min. Eng.* vol. iv. pp. 298–308. [1876.]

Deals chiefly with the coking properties of these coals, which are mostly Cretaceous, but may extend into the Tertiary. Analyses given.

Forwood, Dr. W. H. On Sphenes from Delaware County, Penna. *Proc. Ac. Nat. Sci. Philadel.* p. 176. [1876.]

In mica schist, associated with garnetiferous gneiss.

Frazer, Prof. Persifor, Jun. On the Mesozoic Red Sandstone of the Atlantic States. *Proc. Ac. Nat. Sci. Philadel.* for 1875, pp. 440–442. [1876.]

Remarks on the obscuring of lower beds by the barren spread of red sandstone, from N. Carolina to Connecticut. "Will it pay" to prove the lie, &c. of the Palæozoic rocks by boring? W. H. D.

Gesner, William. On the Coal and Iron Resources of Alabama. *Proc. Ac. Nat. Sci. Philadel.* pp. 163–165. [1876.]

Notes on the coal-fields and the Silurian limestone, hæmatite and limonite.

Gorceix, H. Note sur la roche connue vulgairement au Brésil sous le nom de Canga, et sur le bassin d'eau douce de Fonseca, province de Minas Geraes. [Brazilian Canga and Freshwater Basin of Fonseca.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 321–323, and *Compt. Rend.* t. lxxxii. pp. 631, 632. [1876.]

Canga is a recent ferruginous conglomerate draping the surface of metamorphic and lignitiferous beds. It is formed from the itabirite of the mountain-top, and derives its manganese and gold from thence. W. H. D.

Hall, Charles E. On the Progress of the Museum and Palæontological Work of the Second Geological Survey of Pennsylvania, for the year 1875. *Proc. Amer. Phil. Soc.* vol. xvi. no. 97, pp. 55–60. [1876.]

List of fossils, with localities, Cambrian to Carboniferous.

Hall, Prof. James. The Niagara and Lower Helderberg Groups: their Relations, and Geographical Distribution in the United States and Canada. 27 *Ann. Rep. New York State Mus.* pp. 117–131. [1875.]

Reprinted, with a slightly different title, from *Proc. Amer. Assoc.*, vol. xxii. See GEOLOGICAL RECORDS for 1874, p. 117, and for 1876, p. 336 (notice of map).

Hall, Prof. James. On the Geology of the Southern Counties of New York and adjacent parts of Pennsylvania, especially with reference to the Age and Structure of the Catskill Mountain Range. *Proc. Amer. Assoc.* for 1875, p. 80. [1876.]

The rocks are Portage, Chemung, Catskill, Vespertine, and Umbral.

Hanks, H. G. On the occurrence of Durangite in the tin-bearing region of Durango, Mexico. *Amer. Journ.* ser. 3, vol. xii. pp. 274–276. [1876.]

Occurs in veins. Cassiterite is still forming. The tin-bearing rock is above that producing gold, silver, and copper.

Hawkshaw, Sir John. Brazilian Harbours. Pp. ii, 3, 36, 14, 12, 10, 17, 6; 10 plates. Fol. *London.* [1875.]

A set of Reports to the Brazilian Government, consisting of an Introductory Letter and Separate Reports on 6 harbours. 5 of the plates give sections of borings. W. W.

Hayden, Prof. F. V. The Yellowstone National Park, and the Mountain Regions of Portions of Idaho, Nevada, Colorado, and Utah. Pp. 48; 2 maps, 15 chromolithographed plates (views). Large fol. *Boston.* [1876.]

The introduction and the descriptions of the plates contain geological references, especially with regard to the hot springs.

Hitchcock, Prof. C. H. Remarks on the Cambrian and Cambro-Silurian Rocks of Western Vermont. *Proc. Boston Soc. Nat. Hist.* vol. xviii. pp. 191–193. [1876.]

Some observations on the deposition of the Taconic System.

Irving, R. Kaolin in Wisconsin. *Trans. Wisconsin Ac. Sci.* vol. iii. [1876.]

Kedzie, Prof. W. K. [On the Nebraska Hot Bluff.] *Trans. Kansas Ac. Sci.* vol. iv. [1875.]

The bluff is hot from the oxidation of pyrites.

Matthew, G. F. On the Mollusca of the Post Pliocene Formation in Acadia. *Canad. Nat.* n. s. vol. viii. pp. 104–117. [1876.]

French report and translation noticed in the GEOLOGICAL RECORD for 1874, p. 128, and for 1876, p. 358. Chiefly stratigraphical.

Patrick, G. E. [On the Kansas Chalk.] *Trans. Kansas Ac. Sci.* vol. iv. [1875.]

——. [Analysis of Kansas Soils.] *Ibid.*

——. [On Kansas Salt.] *Ibid.*

Petitot, Père P. Addition aux notes géologiques sur le Bassin du MacKenzie. [Further Notes on the Mackenzie Basin.] *Bull. Soc. Géol. France,* sér. 3, t. iii. pp. 611, 612. [1876.]

Notes (Translated from letters of **E. Billings** and **J. W. Dawson**) of Devonian Brachiopods, Corals, and Plants.

Poter, J. W. Oldhamia in Wisconsin. *Amer. Journ.* ser. 3, vol. xii. p. 226. [1876.]

Note of occurrence, in Potsdam Sandstone, Eau Claire.

Roy, Andrew. The Mahoning Valley Coal Region. *Trans. Amer. Inst. Min. Eng.* vol. iv. pp. 188–190. [1876.]

This coal ranges to 7 feet thick, and lies in a series of hollows and ridges on the Waverly Sandstone, which were formed by erosion before the growth of the coal. R. B. N.

Sauvage, E. Notice sur les minerais de fer du Lac Supérieur. *Ann. Mines*, 7 sér. t. viii. pp. 1–35. [1875.]

Gives a detailed account of the iron-bearing rocks, with analyses of the hematites, magnetites, limonites, and flag-ores of the district, and much statistical information. Concludes with an appendix on the copper-ores. J. D.

Spencer, J. W. On the Nipigon or Copper-bearing Rocks of Lake Superior, with Notes on Copper Mining in that Region. *Canad. Nat.* n. s. vol. viii. pp. 55–81, map. [1876.]

The Nipigon series consists of sandstones with volcanic ashes, diorites, &c., equivalent in age to the Longmynd group. Several ores of copper occur in the district, the mode of working which is described. W. H. D.

Stelzner. Comunicaciones sobre la geología y mineralogía de la Republica Argentina. [Geology and Mineralogy of the Argentine Republic.] *Act. Ac. Nac. Univ. Cordova*, t. i. [1875.]

Sweet, E. T. On the Geology of Northern Wisconsin. *Trans. Wisconsin Ac. Sci.* vol. iii.

Wilcox, Joseph. On Mineral Localities in North Carolina. *Proc. Ac. Nat. Sci. Philadel.* for 1875, pp. 467, 468. [1876.]

Wilkins, D. F. H. Notes upon the Superficial Deposits of Ontario. *Canad. Nat.* n. ser. vol. viii. pp. 82–86. [1876.]

——. Note on the Geology of the Labrador Coast. *Ibid.* pp. 87, 88. [1876.]

Winchell, Prof. N. H. On the Hamilton in Ohio. *Amer. Journ.* ser. 3, vol. vii. pp. 395–398. [1874.]

Stratigraphical details (in Paulding County) extracted from vol. ii. of the Report of the Geological Survey of Ohio. See Geological Record for 1874, p. 125. W. H. D.

——. [Well at Minneapolis.] *Bull. Minn. Ac. Nat. Sci.* for 1875.

1421 feet through L. Silurian (Trenton Limestone and lower beds) to Primordial.

Wysse, L. L'exploration de l'isthme de Darien en 1876–1877. *Bull. Soc. Géogr. Paris*, sér. 6, t. xiv. p. 561.

5. *ASIA.*

Sub-Editor F. Drew, F.G.S., Assoc. R.S.M.

Abich, H. Das thrialetische Thermalquellensystem in Karthalinien vom geologischen Standpunkte betrachtet. *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 820–829.

Notices the hot mineral springs near Tiflis and Bagdad, their alkaline salts, &c., and connects them with the andesites and bituminous schists of that region, of which analyses are noted. E. B. T.

Alenitzin, W. [Coast-deposits of the Sea of Aral.] In Russ. 8vo. *St. Petersburg.*

Anon. *Geograph. Mag.* vol. iv. p. 216.

Note of an active volcano in E. Persia, nearly S. of Sístán.

Ball, V. Geology of the Rájmahal Hills. *Mem. Geol. Surv. Ind.* vol. xiii. pp. 94; 5 maps and 6 pls.

The area, 4000 sq. miles, is S. and W. of the Ganges. The rock-groups in descending order are—alluvium, laterite, Gondwána system (including Rájmahal, Dubrajpur, Barákar, and Tálchir groups), and Metamorphic series. These are fully described. Detailed sections showing the occurrence of coal are given. In the Upper Gondwána are many beds of contemporaneous trap. A chapter on Economic Resources gives a list and description of the coal-seams known, and information on building-stones, limestone, pottery-clay, and iron-ores, with analyses of the last. F. D.

——. On the 'Atgarh Sandstones' near Cuttack. *Rec. Geol. Surv. Ind.* vol. x. pp. 63–68, map.

Gives an account of the mode of occurrence of the rocks so named, W. and S.W. of Cuttack. Their age has been proved by fossil plants to be later than that of the groups of rocks overlying the coal measures in the Tálchir coal-field: the likelihood of finding coal beneath them is therefore lessened. Still some sites are named for borings which might reach to coal, or else the presence of metamorphic rocks beneath the sandstones may be proved without any coal measures intervening. F. D.

——. On the Geology of the Mahanadi Basin and its vicinity. *Rec. Geol. Surv. Ind.* vol. x. pp. 167–186, map.

The area described is 50,000 sq. miles, of which two thirds are broken, hilly ground, whose extreme height is over 5000 feet. The formations are described in descending order. 1500 or 2000 feet of rocks (? Mahadeva series) rest unconformably on the next (coal-bearing) group. This (Damúda) series contains Kamthi, Barákar, and Talchír beds. Below comes the Vindhyan series in two groups, one a great thickness of azoic sandstones, quartzites, and conglomerates, the other limestones, shales, and sandstones. The metamorphic series is described in some detail for different areas; it very possibly has been altered at one period, but is probably the result of the metamorphism of more than one series of rocks. F. D.

Ball, V. On the Diamonds, Gold, and Lead Ores of the Sambalpúr District. *Rec. Geol. Surv. Ind.* vol. x. pp. 186–192, map.

The source of the diamonds is probably a group of rocks of the Vindhyan series; the most favourable locality for future operations is indicated, and an account is given of the native method of washing. The gold comes ultimately from the metamorphic rocks; it may be derived proximately from rocks of the Talchír series. In one locality a lode of galena in quartz gangue, and in another some traces of galena, have been found. F. D.

Bertels, G. A. Ueber den Naphta-Distrikt des nordwestlichen Kaukasus. [Naphtha-district of the N.W. Caucasus.] *Berg- Hütt. Jahrb.* Bd. xxv. pp. 267–282. Reproduced from *Corr-Blatt nat. Ver. Riga*, 21. Jahrg. no. 11.

Describes the geological position and mode of occurrence of petroleum in the peninsula of Taman and on the W. side of the Kuban River, giving a list of previous publications on the subject. The springs, considered to be due to gaseous and not hydrostatic pressure, are mostly in immediate connexion with mud volcanoes, or on a line parallel to their direction. A trial-boring, after passing through about 240 feet of clays and marls, reached a bed of bituminous sand, from which liquid naphtha was pumped in considerable quantity. The most productive well gave an average of 390 cwt. of naphtha daily for 57 days in 1866. H. B.

Blanford, W. T. Geological Notes on the Great Indian Desert between Sind and Rájpútána. *Rec. Geol. Surv. Ind.* vol. x. pp. 10–21.

Describes the rocks met with in making two traverses across the Desert, from Sehwan on the Indus to Jodhpúr, and from Jodhpúr, *viá* Jesalmír, to Rohrí on the Indus. The oldest rocks seen are named Maláni beds; they are volcanic, chiefly porphyritic felsites; but some ash beds also are found; their geological position is unknown. Next above (occurring at Lowo and Pokran) are variously coloured shales, sometimes much altered. Towards their base pebbles and boulders of the Maláni rocks are found; among them there are some signs of icework; the age of these also is unknown. Then come the Jodhpúr sandstones, which *may* belong to the Vindhyan. Next are three groups, which in all probability are Jurassic—the Bálmír sandstones, above them the Jesalmír limestones containing many fossils, and (probably higher than these) the Ammonite-bed of Kuchrí. In one place Nummulitic limestone was met with. The areas of blown sand are described. Along the east of Sind the sandhills are in parallel ridges, running N.E. and S.W.; elsewhere they are more scattered. They always have a steep slope to the N.E. and a gentle slope to the S.W. An inlet of the sea must have extended far into this area. F. D.

Burton, R. Gold Discoveries in Midian. *Land and Water*, Sep. 1.

A short account of the exploration, with the discovery of old mines and workings closed for 4000 years.

Chandrasekhara, Banurji. The Kaimúr Range. *Journ. As. Soc. Beng.* vol. xlvi. pt. i. pp. 16–36.

Contains notes on the geological features, pp. 18, 19.

Drasche, Dr. Richard von. Bemerkungen über die japanischen Vulkane Asama-Yama, Jaki-Yama, Iwa-wasi-Yama und Fusi-Yama. [Remarks on certain Volcanoes in Japan.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvi.; *Min. Mitth.* Heft i. pp. 49–60; 7 plates, 5 woodcuts.

Observations on four volcanoes in the N. part of Niphon. Asama-Yama is the most active of these. Jaki-Yama is extinct, though in most catalogues of volcanoes it is recorded as active. At Iwa-wasi-Yama, the only record of subterranean heat is to be found in the streams of hot air which issue from clefts in the volcanic rocks: the lavas are all doleritic. The sacred mountain Fusi-Yama has not been in a state of eruption since 1707: its lavas also are doleritic. F. W. R.

Feistmantel, Dr. O. Note on *Estheria* in the Gondwána formation. *Rec. Geol. Surv. Ind.* vol. x. pp. 26–30.

Discusses the value of the various species of *Estheria* in grouping the Mángli, Panchet, Kawarsa, and Kota beds. F. D.

——. Kurze Bemerkungen über das Alter der sog. älteren kohlenführenden Schichten in Indien. [Age of the so-called older Coal-bearing Beds of India.] *N. Jahrb.* Heft ii. pp. 147–159.

Maintains, from the evidence of fossil plants, that the entire Gondwána series is Mesozoic, and that the so-called old coal probably belongs to the Trias. The Kach and Jubalpúr group of the U. Gondwána series he regards as M. Jurassic, and the Rajmahal series as Liassic. In the L. Gondwána group he refers the Panchet beds to the Keuper, and the Damoodah and Talcheer group to the Bunter.

F. W. R.

——. [Giants' Cauldrons, &c.] *N. Jahrb.* Heft v. pp. 509–511.

Notices several giants' cauldrons in the Rajmahal Hills and near Barakur in the Raniganj coal-field. Adds some notes on the occurrence of *Williamsonia*, Carr., which is found in 4 localities and in 2 formations in India—in the Rajmahal group (Lias), and in the Kach and Jabalpúr group (Oolitic). F. W. R.

Feistmantel, Dr. O. [Plant-beds of India.] *N. Jahrb.* Heft viii. pp. 809–811.

The Kach (Cutch) flora is M. Jurassic, but is associated with U. Jurassic Cephalopoda. *Glossopteris* has been found in the flora of the Jabalpúr group, which is equivalent to that of Kach. *Glossopteris* also occurs in the Satpura basin in beds equivalent to the Rajmahal group (Lias) and in the Panchet group (Keuper). F. W. R.

Fraas, Prof. O. Juraschichten am Hermon. [Jurassic Rocks of Mt. Hermon.] *N. Jahrb.* Heft i. pp. 17–30, woodcut.

A sketch of the geology of Hermon. The summit of Djebel esch Schech and its slopes toward Medjdel esch Schems are formed of the lowest White Jura, characterized by *Rhynchonella lacunosa.* The *lacunosa*-beds rest on Cretaceous rocks, and are overlain by White and Brown Jura. These Jurassic beds have yielded 34 species of fossils, all known in European strata. A variety of *R. lacunosa,* constant in the Hermon beds, is distinguished as *R. Hermonis.* F. W. R.

Hacket, C. A. Note on the Arvali series in North-eastern Rajputana. *Rec. Geol. Surv. Ind.* vol. x. pp. 84–92, map.

A description of the rocks of the Arvali group and of their mode of occurrence. They consist of quartzite, slate, schist, some limestone, and, towards the base, interbedded trap. Their position with regard to other formations is doubtful. Of useful minerals, the following are found in the area described—copper pyrites, argentiferous galena, manganese-nickel, iron-ore. F. D.

Hughes, T. W. H. The Wardha Valley Coal-field. *Mem. Geol. Surv. Ind.* vol. xiii. art. 1, pp. 154; 3 maps.

The Coal-field has an area of 1600 sq. miles in the centre of India. The formations occupying it range from the Metamorphic series through the Vindhyan, Gondwána, Lameta, and Trappean series (the name "Damúda" formerly employed being now merged in L. Gondwána). These are described in succession, especial detail being given with the Barákar group of the Gondwána series, which contains the coal. Many sections from different areas are given, which prove the existence of a large amount of coal; and for each area the probabilities of its extension are discussed. The extension of the coal-seams into the Nizam's dominions is also noticed. Analyses of the coal are given, which show it to contain on an average less than 50 p. c. of carbon and from 14 to 20 p. c. of ash. The economic value of the iron-ores, the details of many trial-borings, and an experiment in iron-smelting are noticed. F. D.

——. Borings for Coal in India. *Rec. Geol. Surv. Ind.* vol. x. pp. 92–97.

The first of a series of notices of borings. Contains an account of the process and of the rates of progress, with details as to the cost of some bore-holes in the Wardha Valley coal-field, and a list of the strata passed through by the deepest—333 feet. F. D.

Hunter, W. W. A Statistical Account of Bengal. 20 vols.

Short geological notices of some of the Districts of Bengal, of the Chittagong Hill-tracts, and of Hill Tipperah, &c. are given. See General Index in vol. xx. under "Geological formations." F. D.

King, Lieut. J. S. The Island of Perim. *Geogr. Mag.* vol. iv. no. 11, pp. 290–293.

Appears to be a connecting link in the volcanic chain which runs down both shores of the Red Sea, and to owe its origin to a Middle Tertiary volcanic upheaval. Has since undergone successive submersions and upheavals. On the N. side are extensive plains, with old coral beds 10 to 15 feet thick. There are outcrops of schist, shale, and limestone. All the hilly parts are covered with basaltic and trachytic boulders. R. E., Jun.

King, W. Note on the rocks of the Lower Godávari. *Rec. Geol. Surv. Ind.* vol. x. pp. 55–63.

Gives a revised list of rocks found in the Godávari District (sheet 94), classed under Crystalline (gneiss), Vindhyan, L. and U. Gondwána, Secondary (Lameta), and Tertiary. Describes each and correlates these, tentatively, with the rocks of the Nizam's dominions and of the Central Provinces. F. D.

Lartet, Dr. Louis. Exploration géologique de la Mer Morte, de la Palestine et de l'Idumée. [Geological Exploration of the Dead Sea, Palestine, and Idumea.] Pp. vi, 326; 14 pls. (maps, sections, fossils). 4to. *Paris.*

Part 1. Describes the physical geography of Syria and Arabia Petræa, with a *résumé* of previous geological work. Treats of the crystalline rocks and schists, the Cretaceous and older formations, with a description of the Cretaceous fossils. Describes the volcanic, Tertiary, and Recent formations, and closes with a chapter on the prehistoric remains of man, &c. Part 2 contains a special account of the Dead Sea, its basin, and formation. The origin and variation of the saltness of the Dead Sea and the bituminous deposits of the district are fully described. Plate 1 is a geological map of Palestine, on a scale of 1 to 1,100,000; pl. 2 is a geological map of the neighbourhood of the Dead Sea, on a scale of 1 to 300,000; pls. 3–6 are sections; pl. 7 prehistoric remains; pls. 8–14, figures of the invertebrate fossils described; and there are 7 woodcuts of dolmens. The following are the new species, most of which are figured:—*Clupea Larteti* (Sauvage), *Ammonites Luynesi*, *A.* sp., *Murex* sp., *Pyramidella* sp., *Cerithium* sp., *Triphoris Vogüei*, *Turritella Seetzeni*, *T. Maussi*, *T. Reyi*, *T.* sp., *Scalaria Goryi*, *Ringicula* sp., *Pterodonta* sp., *Pholadomya Luynesi*, n. sp., *P. Vignesi*, n. sp., *Leda Grovei*, *Venus* sp., *V. Forgemolli*, *Cytherea* or *Lucina*, *Crassatella Falconeri*, *Cardium Hillanum*, Sow., var. *Moabiticum*, *C. Combei*, *Ostrea Luynesi*, *O. vesicularis*, Lamk., var. *judaica*, *Cidaris*. W. R. J.

Lewis, Rev. E. R. Notes on the Geology of the Lebanon. *Geol. Mag.* dec. ii. vol. iv. pp. 159, 160.

Fossils, determined by Dr. O. Fraas, show that Mt. Hermon consists of Jurassic rocks.

MacMahon, C. A. The Blaini Group and the "Central Gneiss" in the Simla Himalayas. *Rec. Geol. Surv. Ind.* vol. x. pp. 204–223, map.

The outcrop of the Blaini and Infra-Blaini rocks is traced. The fact of the beds being flat on the top of the mountains, and more disturbed on their flanks and in the valleys, is explained by supposing that the hills had been to a great extent carved out before the last disturbances. The apparently inverted contact of the Blaini and other rocks with the crystalline gneiss is explained on the supposition of the line of contact being masked by the subsequent metamorphism of the younger rocks at the point of contact in the wet way, and by compression of the two series against each other. Some information is added on the microscopic characters of the gneiss, which are stated to resemble those of an igneous rock. F. D.

Mallet, F. R. On recent Coal Explorations in the Darjiling District. *Rec. Geol. Surv. Ind.* vol. x. pp. 143–148.

These were made in the band of Damúda rocks that runs 2 or 3 miles from the base of the hills; they demonstrate the worthlessness for economic purposes of the coal, which is anthracitic, but powdery from the great pressure it has undergone. F. D.

——. Limestones in the neighbourhood of Barákar. *Rec. Geol. Surv. Ind.* vol. x. pp. 148–152.

A notice of some limestones on W. border of the Raníganj coal-field, with special reference to their fitness for use as a flux at the Barákar iron-works. Analyses are given. F. D.

Medlicott, H. B. Annual Report of the Geological Survey of India, for 1876. *Rec. Geol. Surv. Ind.* vol. x. pp. 1–7, map.

A sketch of the progress of the Survey, with some remarks on the position of the Gondwána series.

Milne, Prof. John. A Visit to the Volcano of Oshima [Japan]. *Geol. Mag.* dec. ii. vol. iv. pp. 193–199, 285.

Describes the mountain, its eruptive phenomena, &c.

——. The Geological Report in Dr. C. Beke's 'Discoveries of Sinai in Arabia and the Land of Midian.' Pp. xx, 606. 8vo. *London.*

Mossman, S. Delta of the Yangtsze river in China. *Geogr. Mag.* vol. iv. pp. 256–260.

A description of the delta, with some information on the stages of its formation.

Naumann, E. Die Vulcaninsel Ooshima und ihre jüngste Eruption. [The Volcanic Island Ooshima, and its last Eruption.] *Zeitschr. deutsch. geol. Ges.* Bd. xxix. Heft 2, pp. 364–391, pls. v.–ix. (map and views), woodcuts.

Ooshima is one of 7 islands lying off the Idzu promontory, about 60 nautical miles from the capital of Japan. It is wholly a volcanic mountain, 2450 feet high, and 22 nautical miles in circumference. It has older and newer cones, like Vesuvius. The chief lava is an augite-andesite, from analysis calculated to contain sanidine 36 per cent., labradorite 21 per cent., augite 29 per cent., &c. The eruption was at its height between January 20 and February 6, 1877. Japan is said to have 15 volcanoes, but none of them continuously active. E. B. T.

Ness, W. The Warora Coalfield. *Coll. Guard.* vol. xxxiv. pp. 629, 658.

Gives a plan and description of borings for coal at Warora, in Central India.

Nordenskiöld, A. E. Redogörelse för en expedition till mynningen af Jenissej och Sibirien år 1875. [Report of an Expedition to the Mouth of the Jenissei and Siberia in 1875.] *Bihang K. Svenska Vet.-Akad. Förhand.* Bd. 4, no. 1, pp. 1–114.

On caves at Renö and Lavangs mountain, p. 9; Jurassic fossils at Besimannaja Bay, p. 20; Matotschkin schar, geology, p. 21; Jurassic fossils and Permocarboniferous formation at Skoddebay, p. 24; U. Silurian fossils at Cape Grebeni, pp. 28, 29; Quaternary deposits at the E. shore of Jenissej, p. 68; subfossil remains in the "tundra," p. 70; Siberia during the European Glacial period, p. 71; coal-seams at Jenissej, p. 80; remains of mammoth, p. 85. E. E.

Ratte, F. Notes sur l'Indo-Chine. [Cambodia.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 509–522.

Granitic, Silurian ?, Devonian, Triassic, Quaternary, recent, and eruptive rocks are described.

Richthofen, Baron F. von. China. Ergebnisse eigener Reisen und darauf gegründeten Studien. Band 1. Pp. 758; 11 maps. 8vo. *Berlin.*

Describes the Loess of N. China, regarding it as mainly subaerial, though partly lacustrine.

Schmidt, Dr. Carl, and F. Dohrandt. Wassermenge und Suspensionsschlamm des Amu-Darja in seinem Unterlaufe. [Water and Mud of the Amu Darya.] *Mém. Ac. Imp. St. Pétersb.* sér. 7, t. xxv. no. 3, pp. 48, pl. (curves).

Give measurements of the depth, velocity, and volume of the Amu

Darya, and treat of the suspended matter. Tables show the proportions of sediment at different times of the year, its chemical composition, and a comparison of the amount of suspended matter with that of other rivers. W. G.

Spratt, Admiral T., and R. Etheridge. Remarks on the Coal-bearing Deposits near Erekli (the ancient Heraclea Pontica, Bithynia). *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 524–533.

11 or 12 seams of coal, of varying thickness and quality, crop out at the sides of a valley. The coal is of good quality and workable thickness. The age is proved by plants to be Carboniferous. The occurrence of volcanic rocks is mentioned. F. D.

Theobald, W. On the occurrence of erratics in the Potwar, and the deductions that must be drawn therefrom. *Rec. Geol. Surv. Ind.* vol. x. pp. 140–143.

The Potwar country is a plateau occupied by alluvial or lacustrine deposit. On this blocks of gneiss have been found, many 20–40 feet in girth, chiefly arranged in two lines, several miles long. It is inferred that when the Himalayan glaciers had their greatest extension Potwar was one great lake, into which glaciers descended, carrying débris from the hills of Hazára and Kashmir. F. D.

——. Remarks, explanatory and critical, on some statements in Mr. Wynne's paper "On the Tertiaries of the North-west Panjáb." [See p. 146.] *Rec. Geol. Surv. Ind.* vol. x. pp. 223–225.

Insists on a division and classification of the erratics mentioned by Mr. Wynne.

Tietze, Dr. E. Ueber einen kurzen Ausflug nach Krasnowodsk im westlichen Turkestan. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. pp. 1–6.

Geological notes on the country round Krasnowodsk Bay (Caspian). The near hills consist of eruptive rocks, among which is a columnar and platy porphyrite; the higher hills consist of limestone. In the Kubadagh the limestone and gypsum series is supposed to be of secondary age. E. B. T.

——. Bemerkungen über die Tektonik des Albursgebirges in Persien. [The Elburz Chain.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. Heft 4, pp. 375–430.

Contains details concerning beds in the parts of the chain traversed, crystalline schists, Old Red Sandstone, limestone and shale, which may be Devonian or Carboniferous, Triassic (?) dolomites, Lias with coal-beds, U. Cretaceous and Tertiaries, being noted. The lie of the beds, direction of anticlinals, and position of the volcanoes (Demavend, &c.) are especially considered in reference to the views of Suess on the formation of mountains. The points in which it does not correspond with Suess's generalizations, its resemblance geologically to the Himalayas rather than to the Kuen-lun or Karakorum, with which Hochstetter had deemed it continuous from orographical considerations, are pointed out. Many comparisons are made with phenomena of other mountain chains. E. B. T.

Waagen, W. Note on the Geology of India. *Rec. Geol. Surv. Ind.* vol. x. pp. 98–100.

A translation from the German of a note mentioned in the GEOLOGICAL RECORD for 1876, p. 296; here followed by a criticism by **Mr. H. B. Medlicott.** F. D.

Whitney, J. D. The Chinese Loess Puzzle. *Amer. Nat.* pp. 705–713.

Describes the distribution and mode of occurrence of the Loess deposits of China.

Wynne, A. B. Note on the Tertiary and underlying rocks in the North-west Panjâb. *Rec. Geol. Surv. Ind.* vol. x. pp. 107–132, map and plate of sections.

Between the Salt range and the outer Himalaya, from the Jhelum river to beyond the Indus, there is a plateau of 7000 square miles, 1000 feet above the plain, occupied by Tertiary rocks, and surrounded by hills formed by the outcrop of older formations. The Tertiary rocks are:—L. Nummulitic (pale limestones, 1000 feet); U. Nummulitic (variegated clays and sandstones, with gypsum, 800 feet): Murree Beds (harder grey sandstones, with clay, 7500 feet); L. Siwalik (soft grey sandstones, 10,000 feet); U. Siwalik (sandstones, conglomerates, and clays, 4000 feet). This is a conformable series. The beds below the Tertiaries are described; the southern or Salt-range rocks differ from those of the northern outcrop—the Himalayan series of W. Panjâb. In the former there are 9 groups, the lowest the saline series; this is followed by purple sandstone, without fossils; *Obolus*-beds, marked by valves of *Obolus* or *Siphonotreta*, a Silurian form; magnesian sandstones; speckled sandstones; Carboniferous; Triassic; Jurassic; Cretaceous. The 9 groups seem to be of marine origin, and conformable.

The section on the Himalayan side differs much. Next to porphyritic granite come metamorphosed slates with some limestone, which is probably older than Carboniferous and may be Silurian. Unconformably upon these are sandstones, &c., called Infra-Triassic. Then come Triassic limestones with some shale, then Jurassic limestones, then a Cretaceous band, none of these resembling the formations of the corresponding epoch on the Salt range. An account of the disturbances and of the sections follows. F. D.

See also:—

Campbell, J. F. Himalayan Glaciation: *post*, under PHYSICAL GEOLOGY.

Keatinge, R. H. Earthquakes in Assam: *post*, under PHYSICAL GEOLOGY.

Medlicott, H. B. On Mr. Campbell's paper on Himalayan Glaciation: *post*, under PHYSICAL GEOLOGY.

Milne, Prof. J. Across Europe and Asia: p. 83.

Stache, Dr. G. Fusulina Limestone, Sumatra: p. 95.

Tween, A. Analysis of Ránigani coals: *post*, PETROLOGY.

SUPPLEMENT FOR 1876.

Feistmantel, Dr. Ottokar. Weitere Bemerkungen über die pflanzenführenden Schichten in Indien und deren mögliches Alter. [Plant-beds of India, and their probable Age.] *Verh. k.-k. geol. Reichs.* pp. 165–168. See GEOLOGICAL RECORD for 1876, p. 147.

Gröger, F. Das Antimonvorkommen im Districte Sarawak auf Borneo. [Antimony in Sarawak.] *Verh. k.-k. geol. Reichs.* p. 87. [1876.]

Morgan, Alfred. On the Khāsi Hill Tribes of North-eastern Bengal, and on the Geology of the Shillong Plateau. *Proc. Lit. Phil. Soc. Liverpool*, vol. xxx. pp. 115–128; geol. section.

Geology, pp. 121–128. The formations described are:—Alluvial, Nummulitic, Cretaceous, Silhet Trap, Granite.

Tietze, Dr. E. Ueber die geolog. Zusammensetzung des Albursgebirges in Persien. [Geology of Elburz Mts., Persia.] *Verh. k.-k. geol. Reichs.* p. 359. [1876.]

Devonian, Carboniferous, Lias, U. Cretaceous, L. and U. Tertiary rocks occur in the district.

6. *AFRICA.*

Sub-Editor E. B. Tawney, F.G.S.

Anon. Coal in South Africa. *Coll. Guard.* vol. xxxiv. p. 499.
Notes the discovery of coal near Dordrecht and Queenstown.

Baines, Thomas. The Gold Regions of South-eastern Africa. Pp. xxiv, 188; plates. 8vo. *London.* Price 15*s.*

Brown, Dr. J. C. Water Supply of S. Africa; and facilities for the Storage of it. 8vo. *Edinburgh.*
Besides physical geography, contains geological facts.

Cameron, V. L. Across Africa. 2 vols. 8vo. *London.*
In vol. ii. there are some geological references in chaps. xv., xvi., and a notice of some mineral products in chap. xvii.

Daubrée, Prof. Rapport sur un Mémoire de **M. Stanislas Meunier,** ayant pour titre: "Composition et origine du sable diamantifère de Du Toit's Pan (Afrique Australe)." [Report on M. Meunier's Paper on the Diamond-sand of Du Toit's Pan: see *post.*] *Compt. Rend.* t. lxxxiv. pp. 1124–1130.
A *résumé* of all that has been written on the subject.

Fuchs, Th. Die geologische Beschaffenheit der Landenge von Suez. [Geological Structure of the Isthmus of Suez.] *Anz. k. Ak. Wiss.* Jahrg. xiv. pp. 49, 50.
The isthmus consists of very recent beds. Miocene rocks occur near.

Le Chatelier, H. De l'existence aux temps historiques d'une mer intérieure en Algérie. [Sahara Sea, &c.] *Rev. Scient.* sér. 2, t. xii. pp. 656–660.
The only fossil is a *Cardium*, allied to *C. edule*, in a thin bed. It is an error to adduce this as occurring on the surface soil; it is washed out of this bed if so found. The bed occurs up to a height of 300 metres. E. B. T.

——. Sur les sels des chotts algériens. [Salts of the Algerine Chotts.] *Compt. Rend.* t. lxxxiv. pp. 396–398.
The salt crusts of the chotts are composed of chloride of sodium only in the damper parts; elsewhere there is also sulphate of soda (from 0 to 63 per cent.). G. A. L.

Mackenzie, D. The Flooding of the Sahara. Pp. xxx, 287; illustrated. 8vo. *London.*

Scattered notes on the areas of depression below the sea-level in N. Africa.

Meunier, Dr. Stanislas. Composition et origine du sable diamantifère de Du Toit's Pan (Afrique Australe). [Composition and Origin of the Diamond-sand at Du Toit's Pan, S. Africa.] *Compt. Rend.* t. lxxxiv. pp. 250–252.

Regards the diamond-bearing deposits as similar in mode of origin to the so-called vertical alluvia or granitic sands of the Paris Basin.

Pomel, A. Les grès dits nubiens sont de plusieurs âges. [The Nubian Sandstones of Various Ages.] *Bull. Soc. Géol. France*, sér. 3, vol. iv. pp. 524–528.

Devonian, Carboniferous, Jurassic, Neocomian, and Garumnian sandstones have been confounded under the name of Nubian sandstone.

Pouyanne, —. Notice géologique sur la subdivision de Tlemcen. [Geology of Tlemcen, Algeria.] *Ann. Mines*, sér. 7, t. xii. pp. 81–154, pl. iv. (geol. map).

Describes the sedimentary deposits, which are correlated with European deposits from Lias to Quaternary; also the eruptive rocks, including granite, dioritic rocks, porphyry, and basalt. Notices the dislocations observed. J. D.

Roudaire, Capt. E. Sur la communication qui a dû exister, aux époques historiques, entre les Chotts de la Tunisie et la Méditerranée. [The Connexion, in Historical Times, between the Tunisian Chotts and the Mediterranean.] *Compt. Rend.* t. lxxxiv. pp. 176, 177.

——. [Survey for an Inland Sea in Algeria.] *Revue des Deux Mondes*, vol. xx. p. 954. See *Proc. Inst. Civ. Eng.* vol. xlix. pp. 339–342.

Schweinfurth, Dr. G. A Trip through the Western Desert of Egypt. *Athenæum*, June 23, p. 801.

Started from Helnan, and journeyed over the Eocene limestone plateau to the Wadi As-khar, which leads up to the southern Hamāda. Explored the M. Cretaceous beds near the Monastery of St. Paul, and the chalk of the Wadi Mor, where he discovered several new *Ammonites.* Describes the chain of the Porphyry Mountains, which extends from lat. 26° to 29° N., and the porphyry quarries at Gebel-el-Dukhan. Ascertained that the western boundary of the Egyptian Nummulitic plateau coincided with a line connecting Keneh with Suez. A. J. J-B.

SUPPLEMENT FOR 1874–1876.

Anon. Note on the Geology of South Africa. *Cape Monthly Mag.* vol. x. p. 62. [1874 or 1875.]

——. Dunn's Geological Map: A Finale. *Cape Monthly Mag.* vol. xi. p. 256. [1875.]

——. Day in Du Toit's Kloof.—The Manganese Mines. *Cape Monthly Mag.* vol. xi. p. 311. [1875.]

Bleecher, —. Recherches sur le terrain tertiaire supérieur des environs d'Oran. [U. Tertiaries of Oran.] Pp. 10. 8vo. *Montpellier.* [1874.]

Lenz, Dr. O. Reisen in Africa. *Verh. k.-k. geol. Reichs.* pp. 230–232. [1876.]
From a letter of **Von Hauer,** in Okande.

Pouyanne, —. Note sur la région ferrifère des Ouelhassa. [Iron-district of Ouelhassa.] *Ann. Mines,* sér. 7, t. ix. p. 81. [1876.]

Stache, Dr. G. Geologische Touren in der Regentschaft Tunis. [Tour in Tunis.] *Verh. k.-k. geol. Reichs.* pp. 34–38. [1876.]

——. Die quartären Binnenablagerungen des Küstenstriches der kleinen Syrte zwischen Gabes und dem Uëd Akerit. [Quaternary Shell-beds of the Coast of Tunis.] *Verh. k.-k. geol. Reichs.* pp. 121–123. [1876.]

——. Die Erzlagerstätte des Djebel Reças bei Tunis. [Tunisian Ores.] *Verh. k.-k. geol. Reichs.* pp. 56–60. [1876.]
Gives analyses, by **Patera,** of seven lead- and zinc-ores, and of two limestones in which they occur.

Vacek, M. Ueber einen fossilen Büffelschädel aus Kordofan. [Buffalo-skull from Egypt.] *Verh. k.-k. geol. Reichs.* pp. 141–144. [1876.]

7. *AUSTRALASIA.*

Sub-Editor R. Etheridge, Jun., F.G.S.

Allport, M. [Geological Features of the North Coast of Tasmania.] *Papers and Proc. R. Soc. Tasm.* for 1876, pp. 60, 61.

Chiefly refers to the discovery of seeds and the remains of a cone in a well-known bed of travertin at Geilston Bay. The plant-remains are thought by Von Mueller to belong to extinct genera. The travertin was formerly thought to be Post-tertiary; but it must now be referred to an earlier date. R. E., Jun.

Anon. Coal in Australia. *Coll. Guard.* vol. xxxiii. p. 766, vol. xxxiv. p. 66, and *Iron*, vol. x. p. 141.

Notes the discovery of a seam of coal in South Gippsland, 18 inches thick at the outcrop, increasing to 2 feet. Details of boring operations at Coleraine, Victoria. Bore 182 feet. 5 or 6 seams of coal passed through. R. B. N.

——. Coal in New Zealand. *Coll. Guard.* vol. xxxiv. p. 1030.

Refers to the coal worked at the Greyworth Company's mine.

Berggren, Suen. Et Besög i de vulkanske Egne paa Ny Zee'and. [The Volcanic Parts of New Zealand.] *Dansk. Geogr. Selsk. Tidskr.* Bd. i. pp. 141–144; 2 pls. (views).

A description of the gas- and mud-volcanoes and the hot springs in the N. part of New Zealand, with their terrace-formed or stair-like deposits of siliceous sinter. E. E.

Booth, B. S. On a Second discovery of Moa Bones at Hamilton. *Trans. N. Zealand Inst.* vol. ix. pp. 365, 366.

At Moa-bone pit, No. 2, on the Cornishman's claim.

Clarke, Rev. W. B. On the Deep Oceanic Depression off Moreton Bay. *Journ. R. Soc. N. S. Wales*, vol. x. pp. 75–82. (Noticed in the Geological Record for 1876, p. 160.)

Couchman, T. Geological Survey of Victoria. Report of Progress for 1876. Pp. vii, 189; maps, plans, and sections. 8vo. *Melbourne.*

Report on condition and work of the Survey; State of Victorian Palæontology, p. 15; Laboratory work, p. 21; Underground Surveys, p. 23; Prospecting Operations, p. 27; Auriferous veins, p. 34; and the following sub-reports:—

a. **R. A. F. Murray.** Progress Report on Geology of Portion of Country between the Thomson and Wonnangatta Rivers, N. Gippsland, pp. 52–57; map. Treats of the U. Silurian; L. Carboniferous Avon Sandstones; the Glenmaggie Tertiaries, consisting of rocks and gravels of M. Tertiary age, a lava flow (? Older Volcanic), with overlying gravels and ferruginous cement-beds, U. Tertiary. Evidence of an old river-course or "lead," now filled by basalt, exists.

b. **F. M. Krausé.** Notes on the Geological Survey of Creswick, pp. 57–68; sections. Described under the following headings:—Most Recent (Alluvial and Post-pliocene); Recent (U. Pliocene, with Newer Volcanic); Older Gold Drift (M. Pliocene); Oldest Gold Drift (L. Pliocene); L. Silurian and Quartz Veins; Catalogue of Minerals.

c. **Norman Taylor.** Report on the Geological Survey of Learmonth, pp. 68–74. A general description of the district. The W. area consists of low granitic ridges partly covered by basalt, the E. of low Silurian ranges, with quartz reefs, obscured by a volcanic outburst, and overlain by a newer Pliocene Drift.

d. **A. W. Howitt.** Notes on the Geological Structure of North Gippsland, pp. 75–117, t. 1 (sections and views). Description of the area extending from the Snowy Bluff to the Dargo River, crossing the principal igneous and metamorphic areas. The rocks of the former consist of contemporaneous interbedded basalts, probably of Devonian age. The line of country traversed by the section between the Snowy Bluff and the Crooked River consists of highly inclined, and in places somewhat altered, L. Silurian slates and sandstones with quartz veins, in which are the principal gold-workings. At the Crooked River the Silurian mountains are levelled off by a basaltic plateau of Miocene age. Surrounding the scarped edge of the plateau, and resting upon the older rocks, water-worn auriferous quartz gravel has been met with in places, and at Mayford is underlain by a plant-bed with Miocene plants. Many microscopic sections are given; and the question of denudation and metamorphism is entered on.

e. **J. C. Newbery.** Analysis of a Parcel of Cobaltiferous Manganese Ore from a dyke at the Little Dorrit Claim, Grant, p. 117. Average assay gave less than 2 p. c. of oxide of cobalt.

f. **A. W. Howitt.** Notes on the Geology of Part of the Mitchell River Division of the Mining District of Gippsland, pp. 118–126; sections. The sequence of the strata is as follows:—

Post Tertiary	Recent. Swamps, &c.; river gravels now forming. Older (Pleistocene). Flats and terraces above flood-mark; high-level river-gravels; ferruginous quartz conglomerates, &c.
U. Tertiary.	Sandy and clayey beds, with ferruginous pipes and nodules.
M. Tertiary.	Shelly limestone, with marine fossils.
U. Palæozoic (? Devonian).	Intrusive granites.
L. Palæozoic (L. ? Silurian).	Slates and sandstones, with auriferous quartz veins.

g. **R. A. F. Murray.** Report on the Geology of Portion of the Cape Otway District, pp. 127–135; map and sections. The strata are described under the following headings:—(*a*) Most Recent (Post Pliocene and

Alluvial); *b.* Recent (U. Pliocene); *c.* Newer Volcanic (Basalt, lava, &c.); *d.* U. Tertiary (L. Pliocene); *e.* M. Tertiary (Miocene); *f.* L. Tertiary (Oligocene); *g.* Mesozoic (Carbonaceous, Oolitic). No auriferous quartz, or other veins in the Mesozoic strata, which forms the bed-rock of the district. The quartz-gravel drifts (Pliocene) contain fine gold in minute quantity.

h. **F. M. Krausé.** Report on the Site of the proposed Prospecting Operations at Chilwell, Mercer Hill, Geelong, pp. 135–137, plan. Gives details of the strata (Tertiary) passed through, and remarks on the probability of finding gold.

i. ——. Report on Site proposed for Prospecting Operations at the Upper Yarra, p. 138, map and section. The country around Warburton consists of U. Silurian and granite, with auriferous beds of M. Pliocene age. From 30 to 150 feet above the level of the Yarra River flats the slopes are covered with a Newer Pliocene deposit.

k. ——. Report on the Hope Company's Mine, Running Creek, Ovens River, pp. 138–144; plans and sections. L. Silurian slates and sandstones, partly metamorphosed and much dislocated by faults. The 4 auriferous quartz lodes worked in the mine are described.

l. **W. Nicholas.** Notes on some Characteristics of Auriferous Quartz Reefs or Veins, pp. 145–154; tables. Some reefs worked at a depth of more than 1000 feet. In the L. Silurian they strike much more nearly N. and S. than in the U. Silurian, and they run at right angles to the main dividing range. The thickest reefs have proved the richest. Most of the gold is not enveloped in solid quartz, but is found in cavities, laminations, &c. Basalt dykes are often associated, and correspond in direction of strike with the reefs.

m. **Prof. F. M'Coy.** Schedule of Reports on Fossil Specimens in the Collection of the Mining Department, Melbourne, pp. 155–158. A Catalogue, with occasional remarks.

n. **J. C. Newbery.** Laboratory Report for the Year ending Sept. 30th, 1876, pp. 159–175. Contains:—Schedule of Specimens Analyzed; Remarks on Building-stones; New Mineral Occurrences (*Thomsonite, Chabazite, Gabbro, Native Copper, Phosphate of Yttria?, Silicate of Nickel,* &c.); Remarks on the Methods by which gold might be precipitated or deposited from mine-water.

o. **Anon.** *Résumé* of Prospecting Parties' Operations, pp. 176–189; 8 sketch maps. The districts prospected were Buninyong, Mount Buller, Upper Yarra, Colac, Moyston, S. and N. Gippsland. R. E., Jun.

Crawford, J. C. On probable Reasons why few Fossils are found in the Upper Palæozoic and possibly Triassic Rocks of N. Zealand. *Trans. N. Zealand Inst.* vol. ix. pp. 561–565; *Proceedings*, p. 615.

The Palæozoic rocks were deposited in an irregular manner in a sea agitated by rapid, conflicting, and changing currents, which would indicate a state of things unfavourable to the growth of animal life, and destructive during the process of deposition to such life as might exist. R. E., Jun.

Etheridge, R., Jun. Gold in the Coal-measures of N. S. Wales. *Geol. Mag.* dec. ii. vol. iv. p. 286. (See GEOLOGICAL RECORD for 1876, p. 165, under **Wilkinson.**)

Hector, Dr. J. Geological Survey of New Zealand. Reports of Geological Explorations during 1873–74. Pp. 9, xx, 164; maps and sections. 8vo. *Wellington.*

The Progress Report, pp. i–xx, treats of:—*a.* W. Coast of S. Island (Coal Seams at Collingwood, Mount Rochfort, and Gray River). *b.* Clent Hills and Mt. Somers: see below under **Haast.** *c.* N.E. portion of S. Island, referring to Capt. Hutton's Survey. *d.* E. Coast of Wellington, rocks of the Amuri Group. *e.* Marlborough and Amuri districts: gives a sequence of the rocks; the conclusions are somewhat at variance with Capt. Hutton's. *f.* S.E. District of Otago: reference is made to recently acquired palæontological evidence as to age of the rocks. *g.* W. Coast District: the occurrence of a Nummulitic Limestone is mentioned, and a stratigraphical scheme proposed. 5 plans are given and 4 sketch sections. These sub-reports follow:—

a. **Dr. J. Haast.** On the Geology of the Clent Hills and Mount Somers Districts, in the Province of Canterbury, pp. 1–19; plate (map and sections). See GEOLOGICAL RECORD for 1874, p. 150.

Notes to accompany a Geological Map and Sections on the Shag Point District, Province of Otago, pp. 19–26; 2 plates (map and sections). See GEOLOGICAL RECORD for 1874, p. 151.

b. **Capt. F. W. Hutton.** Report on the Geology of the N.E. portion of the South Island, from Cook Straits to the Rakaia, pp. 27–58; 3 pls. (map and sections). See GEOLOGICAL RECORD for 1874, p. 153.

c. **A. M'Kay.** Reports relative to the collections of Fossils in S.E. District of the Province of Otago, pp. 59–73; plate (sections). Information is given as to the position of the beds collected from.

d. ——. Reports relative to the collections of fossils made on the West Coast District, S. Island, pp. 74–115. Concerning the Nummulitic and Cobden Limestone in the Valley of the Grey. Information given relating to a large district.

e. ——. Reports relative to Collections of Fossils made in the E. Cape District, N. Island: pp. 116-164. In form of a diary.

R. E., Jun.

——. Geological Survey of New Zealand. Reports of Geological Explorations during 1874–76. Pp. 9, xiii, and 191; maps and sections. 8vo. *Wellington.*

The Progress Report, pp. i–xiii, relates to:—*a.* Coromandel; relation of the auriferous rocks to the volcanic series. *b.* Wangaroa; Coal-bearing strata of the district. *c.* Ohaeawai Mercurial Springs, which deposit a brown sandstone, including thin layers of cinnabar-sand and globules of metallic mercury. *d.* Kaipara District: summary of formations —*Pliocene*, Lavas of Ohaeawai and plastic clays; *L. Miocene*, Komiti beds; *Eocene*, Nummulitic Limestone, &c.; *Cretaceo-Tertiary* containing 3 groups; *Jurassic*, Mahurangi green sandstone; *Trias*, Mangarakau sandstones and slates. *e.* Coal Measures: recent examinations in no way alter the classification. *f.* Special Coal Explorations. *g.* Silver Mines. Contains following sub-reports:—

a. **S. H. Cox.** Report on Coal at Wairarapa, p. 1. Seam of brown coal, 2 inches thick.

b. ——. Report on Antimony Mine, Endeavour Inlet, Queen-Charlotte Sound, pp. 2–6. A lode of Antimonite containing gold in a finely grained greenish schistose rock. Other minor lodes accompany it.

c. ——. Report on Nelson District, pp. 7 and 8. Concerning the mineralogical value of the district from the Dun Mountain to d'Urville Island. The chief formation is the Matai series. Copper and chromite occur in connection with serpentine.

d. ——. Report on Raglan and Waikato Districts, pp. 9–16 (to accompany maps and sections). The sequence of the strata is:—*Pleistocene*: blown sands, boulder formation, and pumice-terraces. *Tertiary*: Kawhia Limestone, Aotea Sandstone, and clay marls (= Whangaroa clays of Hutton). *Cretaceo-Tertiary*: Papakura Limestone, Green and Brown sands, Waitemata beds, *Leda* Marls (= Waitemata beds of Hochstetter), and Coal Measures (with fireclays and ironstone). *Trias*: pyritous slates with *Monotis salinaria.* An unconformity exists between the Pleistocene and succeeding beds.

e. ——. Report on Survey of Buller Coal-field, pp. 17–29 (to accompany maps and sections). The sequence is:—*Black Marls* with *Pecten Zittelli*; *U. Grits*; *Coal* (2 seams); *L. Grits*; *Triassic slates*, forming the base of the coal-field; *Granite.* There are two basins, the "Waimangaroa" and "Ngakawau." Journals of sections are given.

f. ——. Report on the Geology of Resolution Island, Dusky Sound, Otago, pp. 30 and 31. The older crystalline rocks predominate in main part of the island, with older metamorphic slates and schists. True granite not discovered.

g. **A. M'Kay.** Report on Coal at Shakespeare Bay, Picton, pp. 32–35. Rocks of the coal-bearing series of the west coast repose on mica schists and the less-crystalline rocks of the district. Form part of the Tuamarina Formation of Hutton.

h. ——. Report on Weka Pass and Buller Districts, pp. 36–42. *Plesiosaurus* remains cannot be traced higher than the greensands of the Waipara beds; the Weka Pass and L. Saurian beds are conformable; no appearance of the L. Amuri series in the district; on the W. coast of the Middle Island no limestone like that of the Weka Pass or Amuri is to be seen between the *Pecten Zittelli* or *Leda* Marl and the coal-beds.

i. ——. Report on Country between Cape Kidnappers and Cape Turnagain, pp. 43–53 (to accompany maps and sections). The formations in the district may be classed as Secondary, Cretaceo-Tertiary, and Tertiary. The C. Tertiary are unconformable on the Secondary strata, and contain Nummulites and Nummulitic Limestones, but are conformable with the Tertiary. List of fossils given.

k. **A. M'Kay.** Report on Tertiary Rocks at Makara, p. 54. An outlier of the Napier and Castle Point beds probably.

l. ——. Report on Wangaroa North, pp. 55–58 (map). The oldest rocks are Secondary, identical with those along the E. coast of the N. Island, between Cape Kidnappers and Castle Point. Although coal has been met with, the prospects are not promising.

m. **S. H. Cox.** Report on Argentiferous Lode at Collingwood (Richmond Hill Silver Mine), pp. 59–62. Two lodes occur in a gneissic schist, from a few inches to a foot and 2 feet respectively.

n. ——. Report on Westland District, pp. 63–95 (map of W. coast and 2 plates of sections). A granitic belt, with a N.E. strike, forms a line of elevation, as a series of isolated hills. On the E. a metamorphic series (micaceous and chloritic schists) comes on. Near Reefton, on the W. of the belt, fossiliferous cherts, limestone, and slates appear (Devonian), without visible connection with the other rock. Unconformable on the latter and the metamorphic series are certain slates, sandstones, and breccias (the "Auriferous Series"), with quartz reefs, to the W. of the granitic belt. E. of the metamorphic rocks is a group of blue silky slates, with the auriferous reefs of the Taipo, called the "Maitai Series," perhaps identical with the last. The Coal Measures occur in the vicinity of Reefton, unconformable on the Auriferous Series and older fossiliferous beds, and appear to be themselves overlain by the Kanieri Series, greensands, marls, quartzose sands, and conglomerates, containing in their higher portions alluvial gold workings. Unconformably on the latter are the Glacier Drifts. Along the coast from Hokitika to Bruce Bay are auriferous black sand beaches, derived from the metamorphic rocks.

o. ——. Report on Country between Poverty Bay and Napier, pp. 96–105 (maps and plate of sections). The rocks exposed are:—*P. Tertiary*: blown sands of the coast, river alluvium, and deposits of pumice sand and tufa. *Tertiary*, possibly divisible into an upper and lower series, occur in the vicinity of Napier, &c. *Cretaceo-Tertiary*, the oldest beds of the district, of considerable thickness, and probably correspond with the chalk group of the Amuri Bluff: 3 divisions—U. Marls, M. Marls and Calcareous Sandstone, and L. Marls. Lists of fossils given.

p. ——. Report on Survey of Buller Coal-field, pp. 106–120 (2 maps and plate of sections). Details of the following areas of the field:—Todea Creek, Mt. Rochfort and plateau; sea slopes with slip coal; Up. Orikaka country. Journals of many sections given.

q. **R. Denniston.** Detailed notes on the Buller Coal-field, pp. 121–171 (folding map). The ground is divided into areas and described. Lengthy journals of sections are given.

r. **A. M'Kay.** Report on Kaikoura Peninsula and Amuri Bluff, pp. 172–184 (2 maps and plate of measured sections). Chiefly relates to the measurements of certain beds, their position and contained fossils.

s. **A. M'Kay.** Report on Cape Campbell District, pp. 185–191 (maps and sections). Sequence of the beds in this district and equivalents at Amuri Bluff, as follows :—

Flaxbourne and C. Campbell.	*Amuri Bluff.*
Volcanic breccia and beds of green sandstone.	Belemnite and Trigonia beds.
Green sandstone and indurated slate.	Grey and green sands, black grit.
Gritty sandstone, sandy shales with Saurian boulders.	Greensand group, boulder sands, and concretionary green sand.
Flinty beds, with beds of green sand and white limestone.	Green sand with U. and L. Teredo limestone.
White limestone with beds of quartzose and green sandstone.	Amuri limestone.
Green sands passing into grey sands.	Calcareous green sands, or Weka Pass limestone.
Grey marls.	Grey marls.
Awatere beds.	Absent.
Coarse conglomerates.	Absent.

R. E., Jun.

Hector, Dr. J. Geological Survey of New Zealand. Reports of Geological Explorations during 1876–7, with maps and sections. Pp. 8, xx, and 157. 8vo. *Wellington.*

Progress Report (pp. i–xx) contains a new classification of the N. Zealand strata deduced from the results of the Survey up to date, combined with information derived from a study of a large collection of fossils by **Mr. R. Etheridge** and **Dr. Hector.** The general results of the year's work in the following districts are given :—Mt. Somers District, Waikato, Oamaru and Waitaki, Masterton and Napier, Wangarei, Kawakawa, Bay of Islands, Wangarei, Buller Coal-field, Grey River Coal-field, Hokitika, Green Island (Otago). Then follow sub-reports.

a. **S. H. Cox.** Report on the Geology of the Mount Somers District, pp. 1–10. Confirms the accuracy of Dr. von Haast's map of this district: gives notes on :— *a. Clint Hill Series* (? = Mataura Series). *b. Melaphyre Formation*, unconformable on *a*, contains a peculiar siliceous rock, probably deposited from thermal springs, and called "*palla.*" *c. Trachyte Series*: tufas and alternations of quartz-porphyries and pitchstones. *d. Coal Series*: contains 2 coals of distinct age. *e. Calcareous* and *Greensand Beds*: goes into the question of their position.

b. ——. Report on Waikato District, pp. 11–26 (maps and plate of sections). Gives the following classification, and describes the divisions in detail :—

Pleistocene.—Blown sands, Pumice terraces, Boulder formation, Plastic clays and sands.

Eocene.—Kawhia limestone, Aotea sandstone, and Blue clay marls.

Cretaceo-tertiary
Grey marls. Clay marls; sandy marls; and calcareous sandstone.
Chalk marls. Flaggy limestone; calcareous green sands; brown sands and marls; Mercer beds; *Leda* marls.

L. Greensand.—Coal Measures.
Jurassic { Mataura series = Putataka plant beds.
Patataka „ = *Aucella* beds.
Wairoa „ = *Monotis* beds.
Palæozoic.—Maitai „ = Rimutaka slates.

c. **D. Macfarlane.** Notes on the Geology of the Jackson and Cascade Valleys, pp. 27–30 (map and plate of sections). Refers to a geologically unexplored district. The map shows the continuous development of the belt of magnesian rocks from near Jackson's Bay to Martin's Bay. The belt consists of serpentine and dunite, bounded on the E. by the mica-schist of the Otago gold-field, on the W. by the Maitai series, &c.

d. **W. D. Campbell.** Report on the Kanieri and Grey River Coal Districts, pp. 31-40 (4 plans and sheet of vertical sections). Describes the coal seams in detail. Notes new discoveries in Coal Creek and towards the coast at Ten Mile Creek. Existence of coal on the S. side of the Grey River has been proved.

e. **A. M'Kay.** Report on the Oamara and Waitaki Districts, pp. 41–66 (map and plate of sections). Part 1 refers to collection of fossils; part 2 to Geology, thus:—*Older gravels*, forming downs and low hills, succeeded by the chalk group; *Grey marls*; *Ototara limestone* (= Weka Pass stone or Oamaru stone), slightly developed; *Chalk marls* and *Amuri limestone*; *Concretionary Greensands* with Saurian beds and coal seams; *Volcanic Rocks*, dolerites of Mt. Charles.

f. ——. Report on the Country between Masterton and Napier, pp. 67–94 (map and plate of sections). Describes:—*Rimutaka Series*, altered rocks of Manawatu Gorge and the Ruahine Range. *Wairoa Series*, older secondary or younger palæozoic. *Young Secondary Rocks* occupy a small area. *Tertiary beds*: found no beds in the district referable to Hutton's Ahuriri formation. *Higher beds of the Hawke Bay Series*, succeeded unconformably by *Younger Gravels* and *Superficial Deposits*, including the Ruataniwha and Ahuriri Plains. The map and sections are described.

g. **S. H. Cox.** Report on the Geology of the Wangarei District, pp. 95–106 (map and plate of sections). Sequence of the formations thus:—

Recent and Pleistocene.		Harbour deposits and sand dunes; basaltic lavas.
Eocene (?).	Trachyte agglomerate of Hick's Bay.	Trachytes and T. agglomerates and tufas.
Cretaceo-tertiary.	Grey marls and Amuri limestone; *Leda* marls; and Island sandstone.	Up. limestone; brown sandstone; and fucoidal green sandstone.
L. Greensand.	Coal.	Coal and L. limestone; volcanic breccia.
Carboniferous (?).	Rimutaka beds.	Manganese and clay slates.

Detailed descriptions and journals of borings are given.

h. **S. H. Cox.** Report on Country between Opotiki and East Cape, pp. 107–113 (map). A coast-line survey, sequence thus:—*Tauranga Brown Sands* = Pleistocene (" Diluvial pumice sands forming terraces " of Hector); *Tawhiti Beds*, marls and sands with a belt of limestone; *Poverty Bay Oil Rocks*, shales, sandstones, and slates at high angles (?= the Mataura plant beds); *Rimutaka Series*, slates and sandstones, oldest rocks of the district; *Trachytes* and *Trachytic Agglomerates*, between Cape Runaway and Hick's Bay.

i. **R. B. Denniston.** Summary Report of Coal Explorations, Auckland District, pp. 114–138 (8 plans and plate of sections). Journals of sections are given.

k. **W. Laird.** Report on comparative value of coals, p. 139. Results of trial of coal from Wangarei and Bay of Islands.

l. **Dr. J. Hector.** The Otago Coal-fields and the Kaitangata Coal Mine, pp. 139–142 (plan). Description of the mine. Analyses of the coal.

m. **R. B. Denniston.** Report on Green Island Collieries, Otago, pp. 143–154 (5 plans). Description of the collieries, with journals of sections.

n. **S. H. Cox.** Report on Richmond Hill Silver Mine, pp. 155–157. On prospecting operations. R. E., Jun.

Hector, Dr. J. Eighth Annual Report of the Managers of the New Zealand Institute. *Trans. N. Zealand. Inst.* vol. ix. pp. 605–609.

Deals with geological and palæontological additions to the museum. The Reefton fossiliferous slates and Madrepore Devonian limestone are overlain unconformably by the auriferous slates (Maitai series ?). R. E., Jun.

——. Travels in Europe and America. *Trans. N. Zealand Inst.* vol. ix. *Proceedings*, pp. 615–617.

Refers to the examination of a large collection of N. Zealand fossils by **R. Etheridge.**

Hodgkinson, W. O. Report on the Hodgkinson Gold-field. *The Queenslander*, July 28th.

Lofty granite ranges enclose belts of clay, sandstone, and slate, traversed by auriferous reefs in all directions. The quartz is usually white, of a crystalline nature, and has associated with it copper, pyrites, oxide of iron, galena, and sulphur. R. E., Jun.

Hutton, Capt. F. W. On the Relation between the Pareora and Ahuriri Formations. *Trans. N. Zealand Inst.* vol. ix. pp. 590–593.

These formations, previously viewed by him as separate, should be united. In the union of the Kanieri series with the Hawke Bay series he agrees with Dr. Hector, but differs in uniting the Awetere series with that of Shakespeare Cliff. R. E., Jun.

Hutton, Capt. F. W. The Ototara Series, New Zealand. *Geol. Mag.* dec. ii. vol. iv. p. 135.

Correction of errors in Capt. Hutton's paper, noticed in the GEOLOGICAL RECORD for 1876, p. 162.

Johnston, R. M. Further Notes on the Tertiary Marine Beds of Table Cape, Tasmania. *Papers and Proc. R. Soc. Tasm.* for 1876, pp. 79–90 *f*; *Geol. Mag.* dec. ii. vol. iv. p. 417. Noticed in the GEOLOGICAL RECORD for 1876, p. 163.

——. Tasmanite or Mersey "Yellow Coal." Pp. 8. 8vo. *Hobart Town.*

Considers Tasmanite to be chiefly the product of the sporangia of Cryptogamic plants allied to the Club-mosses, washed down by some ancient river, and mixed with fine particles of muddy sediment, to which the resinous bodies readily adhere, and were finally deposited in an ancient arm of the sea. The Tasmanite contains abundant casts of a shell, described as *Pleurotomaria Woodsii*, n. sp. R. E., Jun.

Liversidge, Prof. A. Fossiliferous Siliceous Deposit from the Richmond River, N. S. Wales. *Journ. R. Soc. N. S. Wales*, vol. x. pp. 237–239.

In composition answers to the common siliceous sinters or geyser deposits. Hot springs or geysers do not now exist in N. S. Wales. The district in which the deposit occurs is said to be composed of basaltic and trachytic rocks. Contains the remains of ferns, fruits, and seeds. (See **Mueller,** *post* under PLANTS.) R. E., Jun.

Lucas, Hon. J. Mines and Mineral Statistics. *Annual Report of the Department of Mines, New South Wales for the year* 1876. pp. v, 184; plans, maps, sections, &c. 4to. *Sydney.*

Contains the following:—

a. **H. Wood.** Annual Report of the Secretary for Mines, pp. 1–35.

b. ——. Reports of the Wardens of the Goldfields, 58 in number, pp. 36–116, showing the amount of gold, &c. found, and methods pursued in each district.

c. **W. H. J. Slee.** Annual Report of the Inspector of Mines, pp. 116–128, contains some geological information.

d. **J. Mackenzie.** Report of the Examiner of Coal Fields, pp. 129–142. Gives detailed accounts of many of the Coal seams examined, with vertical sections.

e. **T. Lewis.** Half-yearly Report of the Inspector of Collieries for the Six Months ending Dec. 31, 1876, &c., pp. 143–146.

f. **C. S. Wilkinson.** Report of Progress of the Geological Survey during the year 1876, pp. 147–177. Describes the "Yass Beds" (U. Silurian and Devonian): the country around Wagga-Wagga; the Cambamurra and Jugiong Gold-field; the auriferous quartz-reefs around

Grenfell; the Quondong Lead (with section); the country around Wellington (Siluro-Devonian) and its bone-caves; the Macquarrie River Gold field (with section); the Gulgong District, with its valuable "deep leads" (with section), which have yielded 7 genera and 9 species of new fossil plants, remains of the *Diprotodon* and various *Macropi*, and a fossil *Unio*.

g. **Baron F. von Mueller.** Descriptive Notes on the Tertiary Flora of New South Wales, pp. 178–180. See *post*, PLANTS.

h. **Prof. A. Liversidge.** Report upon Mineral and other Specimens examined for the Mining Department during the year 1876, pp. 181–184: see MINERALOGY. R. E., Jun.

McKay, A. On the Reptilian Beds of New Zealand. *Trans. N. Zealand Inst.* vol. ix. pp. 581–590; *Proceedings*, p. 624.

Gives a bibliographical outline, a description of the beds at localities which came under his personal observation, and his views as to the age and conditions under which the beds were deposited. Considers them to be of younger Secondary age, with an admixture of Tertiary forms; and adopts Dr. Hector's term "cretaceo-tertiary." R. E., Jun.

Robinson, C. The Progress and Resources of New South Wales. Pp. 25. 8vo. *Sydney.*

Information is given relative to the Geological Survey of N. S. Wales, the yield of gold, the existence of tin deposits, lodes of copper, and iron-ore deposits. R. E., Jun.

Russell, H. C. Climate of New South Wales; Descriptive, Historical, and Tabular. Pp. 65. 8vo. *Sydney.*

Miscellaneous geological notes scattered through.

Simon, —. [Notes on the Mines of New South Wales.] *Compt. Rend.* t. lxxxiv. pp. 1043–1045.

A Consular Report, with details of the recent yield of the mines.

Smith, S. P. Sketch of the Geology of the Northern Portions of the Hawke Bay. *Trans. N. Zealand Inst.* vol. ix. pp. 565–576, pls. 22, 23, table of fossils; *Proceedings*, p. 642.

Forms part of a large elongated basin of Tertiary rocks ("Hawke Bay Series" of Hochstetter, "Ahuriri formation" of Hutton, in part), with older rocks deposited on the flanks of some slate mountains further inland. The local subdivisions used are:—*a.* Waikaremoana Sandstones; *b.* Lower Papa beds; *c.* Pohue Papa beds; *d.* Brown sandstone and conglomerate; *e.* Esk or Upper Papa beds; *f.* Brown Papa and calcareous sands; *g.* Napier Limestone; *h.* River terraces, dunes, lagoons along the coast, limestone caves, and beach deposits.

R. E., Jun.

Stephens, T. [On Fossil-Wood.] *Papers and Proc. R. Soc. Tasm.* for 1876, pp. 2, 3.

Notes the discovery of fossil wood in the Penguin Creek conglomerate-breccia, N. coast of Tasmania. Also the occurrence of a carnelian in a piece of fossil wood from Brown's River Beach, Tasmania.
R. E., Jun.

Stephens, T. [Notes on the Coal Shaft at Spring Bay, Tasmania.] *Papers and Proc. R. Soc. Tasm.* for 1876, pp. 74, 75.

Refers to specimens from a trial shaft at Triabunna through the Coal Measures.

Tate, Prof. Ralph. Ostracoda and Foraminifera in the Miocene of South Australia. *Geol. Mag.* dec. ii. vol. iv. pp. 526, 527.

The beds constituting the Plain of the Murray River in S. Australia are Miocene, covered in places by a Pliocene Drift.

Ulrich, G. H. F. [Mineral Deposits of Tasmania.] *N. Jahrb.* Heft v. pp. 494–497, woodcut.

Describes the deposit of tin-ore worked at Mt. Bischoff, where the author found an antimonial mineral allied to zinckenite or to Jamesonite. Notices a mineral occurrence in the Hampshire Hills, between Mt. Bischoff and the coast, where silver-ores are found. Some of the wildest regions in the Parson's Hood range and the Piemen valley contain gold, tin, bismuth, and other metals. With the gold has been found the rare mineral osmiridium. F. W. R.

Webb, J. S. Annual Address to the Otago Institute. *Proc. N. Zealand Inst.* vol. ix. pt. 2, pp. 647–653.

Passes in review papers contributed on the subject of the cause and date of glacial action in N. Zealand, and the date of the extinction of the Moa. R. E., Jun.

Weld, His Excellency F. A. Inaugural Address at Opening of Session of 1876. *Papers and Proc. R. Soc. Tasm.* for 1876, pp. 15–25.

Gives suggestions for future geological research in Tasmania.

Wolff, G. Das australische Gold, seine Lagerstätten und seine Associationen. [Australian Gold, its Deposition and Association.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 82–183; 2 plates (map).

Notices the rocks in which gold occurs, and the minerals occurring with it in veins. No gold-veins occur in rocks more recent than Silurian and Devonian, or associated igneous masses; the veins never pass into the overlying Carboniferous; hence the date of infilling was during the interval in which large movements of the continent took place, and before the oldest Carboniferous were laid down. Corroborative is the occurrence of quartz pebbles containing gold in the lowest Carboniferous conglomerates. Gold also occurs in Jurassic limestones, in shales of Mesozoic coal beds, &c. Statistics concerning both veins, deep leads, and alluvial workings are given. E. B. T.

Woods, Rev. J. E. T. On a Tertiary Formation at New Guinea. *Proc. Linn. Soc. N. S. Wales*, vol. ii. pt. 2, pp. 125–128.

Notices the discovery at Yule Island by the "Macleay Expedition" of a friable, fine-grained, yellow Tertiary limestone. (See **Wilkinson**, GEOLOGICAL RECORD for 1876, p. 171.) The absence of Polyzoa, Foraminifera, and Corals is commented on, The following are the Echini: —*Peronella decagonalis*, Lesson, and *Temnechinus Macleayana*, n. sp.; the latter is allied to *T. globosus* of the British Crag. Considers the limestone as younger than the Murray R., Cape Otway, or Mt. Gambier beds—probably L. Pliocene. R. E., Jun.

——. [Absence of the Gault formation in Australia.] *Papers and Proc. R. Soc. Tasm.* for 1876, p. 66.

An answer to a question, in discussion.

——. History of Australian Tertiary Geology. *Papers and Proc. R. Soc. Tasm.* for 1876, pp. 76–78; *Geol. Mag.* dec. ii. vol. iv. p. 416. See GEOLOGICAL RECORD for 1876, p. 166.

A general outline of the subject. The resemblance between the European and Australian Tertiary rocks is considerable; the latter contain certain Secondary forms, as species of *Trigonia* and *Pleurotomaria*. R. E., Jun.

Victoria. Reports of the Mining Surveyors and Registrars. Dec. 31, 1876, No. 2, pp. 38; March 31, 1877, No. 10, pp. 36; June 30, No. 43, pp. 38; September 30, No. 68, pp. 38, pl. 12. Containing a continuation of **Baron von Mueller's** "Observations on New Vegetable Fossils of the Auriferous Drifts," in which is described a new genus and species of fossil fruit, *Wilkinsonia bilaminata*. Fol. *Melbourne*.

SUPPLEMENT FOR 1876.

Russell, J. C. Notes on the Ancient Glaciers of New Zealand. *Ann. Lyc. Nat. Hist. New York*. [1876.] Abstract in *Nature*, vol. xvi. p. 100. [1877.]

8. *OCEANIA.*

Sub-Editor R. Etheridge, Jun., F.G.S.

Alcock, Sir Rutherford. On the Island of Formosa. *Proc. R. Geogr. Soc.* xxi. p. 265.
The island is rich in coal.

Christy, F. C. Extracts from Diary in Japan. Pp. 18. *Melbourne.* 8vo.
The soil is generally volcanic, overlying in many districts a clay-slate. The minerals are ores of copper, iron, lead, silver, and zinc, gold, coal, and limestone. R. E., Jun.

Darwin, C. Geologischen Beobachtungen über die vulkanischen Inseln. [Volcanic Islands.] 8vo. *Stuttgart.*
A translation from the New English Ed. (see Geological Record for 1876, p. 131), with Preface by **V. Carus.**

Dijk, P. Van. Achtste artesische putboring te Batavia, op Salemba, nabij het landgoed Struiswijk. [Eighth Artesian Well-boring in Batavia, at Salemba.] *Jaarb. Mijn. Ned. O.-Ind.* deel 2, pp. 198–211.

——. Mededeeling omtrent de boring van een artesischen put op het Koningsplein te Batavia. [Artesian Well-boring at Koningsplein, in Batavia.] *Jaarb. Mijn. Ned. O.-Ind.* vol. 2, pp. 214–225.

Dijk, P. Van, J. A. Huguenin, and **R. Everwijn.** Verslag over de Nadere Onderzoekingen naar de waarde der Bruinkolen-Lagen in de afdeeling Lebak van de residentie Bantam. [Examination as to the Value of the Brown Coal in Lebak.] *Jaarb. Mijn. Ned. O.-Ind.* deel 1, pp. 187–238; Introduction, pp. 187, 188.
Includes the following:—
1. **J. A. Huguenin.** Verslag van een Nader Onderzoek van het Kolenveld bij Bodjong-Manik. [The Coal-field of Bodjong-Manik.] Pp. 189–210; 2 maps and several sections.
2. **P. Van Dijk.** Verslag Omtrent de Grondboringen in het Steenkolenveld van Bodjong-Manik (afdeeling Lebak). [Borings in the Coal-field of Bodjong-Manik.] Pp. 211–235.
3. **R. Everwijn.** Algemeene Beschouwingen, betreffende het Bruinkolen-veld in de afdeeling Lebak van de Residentie Bantam. [General Survey of the Brown Coal-field in the Lebak Territory.] Pp. 236–238.

Everett, A. H. Cave-exploration in Borneo. *Athenæum*, no. 2594, July 14, pp. 53, 54.

The Saráwak Territory possesses a considerable tract of limestone, with ossiferous caverns. Bones of Rhinoceros, Pig, Deer, Porcupine, all of recent species, with human bones, have been found in the superficial deposits. Suggests that the working of these caves might throw light on the descent of Man. A Neolithic stone implement was found in the river-gravel of the island. H. B. W.

Everwijn, R. Kolen in de residentie Lampongsche districten op Sumatra. [Coal in the Lampong District of Sumatra.] *Jaarb. Mijn. Ned. O.-Ind.* deel 2, p. 189.

Fennema, R. Mededeeling omtrent eene aardstorting in het laras Pau, afdeeling Agam, Padangsche Bovenlanden. [Report on a Landslip in the Laras Pau, Padang Highlands.] *Jaarb. Mijn. Ned. O.-Ind.* deel 2, pp. 195–197.

Forbes, Dr. L. The Navigator Islands. *Proc. Geogr. Soc.* vol. xxi. pp. 140–148.

The island of Rosa is a coral island. Those of Saraii, Upolu, Tutuila (=Maouna of La Pérouse) are all of volcanic origin, and are more or less surrounded by coral reefs. R. E., Jun.

Hooze, J. A. Artesische putboring op het eiland Onrust bij Batavia. [Artesian Well-boring in the Island of Onrust, near Batavia.] *Jaarb. Mijn. Ned. O.-Ind.* deel 2, pp. 190–194.

Hosken, Commander H. Notes on Coral-Reefs. *Geol. Mag.* dec. ii. vol. iv. pp. 71 and 72.

Relates to the growth of coral patches inside the "Barrier reef" of Vanikoro Island, Santa Cruz group.

Huguenin, J. A. Rapport van het district Toboali, Eiland Bangka. [Report on the District of Toboali, in the Island of Banca.] *Jaarb. Mijn. Ned. O.-Ind.* deel 1, pp. 81–186 (geol. map in two sheets).

Consists of :—1. Geographical Description. 2. Geology and Mineralogy. 3. Tin-bearing ores. 4. Tables containing the above information in a condensed form. R. B. N.

Liversidge, Prof. A. On the Occurrence of Chalk in the New Britain Group. *Geol. Mag.* dec. ii. vol. iv. pp. 529–534.

Large pieces of the so-called "Chalk" are cast up by the sea in one district on the E. side of New Ireland after earthquakes. Contains 81 per cent. of carbonate of lime. Physically it is almost undistinguishable from Chalk, and has had the same organic origin. Foraminifera abundant. R. E., Jun.

Lyman, B. S. Geological Survey of the Oil Lands of Japan. A

Report of Progress for the First Year of the Oil Surveys. Pp. v and 63. *Tokei.* 8vo.

Detailed description of the oil fields. A good deal of geological information scattered through, with remarks on hot springs.

Menten, J. H. Verslag van een onderzoek naar Tinerts op het Eiland Singkep. [Report of a Search for Tin-ore in the Island Singkep.] *Jaarb. Mijn. Ned. O.-Ind.* deel 2, pp. 145–171; 2 maps.

Milne, Prof. J. A Visit to the Volcano of Oshima. *Geol. Mag.* dec. ii. vol. iv. pp. 193–199.

Oshima is the most southern of a chain of islands stretching S. from the entrance to the Bay of Yeddo. The volcano and its eruption are described. R. E., Jun.

Mitchell, W. S. The "Lost Atlantis" and the 'Challenger' soundings. *Nature*, vol. xv. pp. 553–556.

Unger suggested, in 1860, that the European Tertiary Flora had a N. American character, having migrated by way of now sunken lands in the mid-Atlantic, called by him "Atlantis." Deep-sea soundings prove a ridge by way of the Azores, St. Paul's rocks, Ascension, and Tristan d'Acunha. C. E. R.

Morrison, G. J. A Description of the Island of Formosa, &c. *Geogr. Mag.* vol. iv. no. 12, pp. 319–322.

Coal, sulphur, and petroleum exist in considerable quantities. Clay-ironstone has been met with; and jade is said to occur.

Munroe, H. S. The Mineral Wealth of Japan. *Trans. Amer. Inst. Min. Eng.* vol. v. pp. 236–302, pl. v.; *Iron*, vol. ix. pp. 74 and 234.

Gives an outline of the geology. Coal and iron occur in abundance. Total area of coal-fields about 5000 square miles; average thickness of the coal 15 feet. Analyses are given. The oil-lands, sulphur-regions, and porcelain-clays are described. R. B. N.

Murray, J. The Cruise of the 'Challenger.' *Science Lectures*, no. 7, pp. 105–139.

Bermuda is a small cluster of coral islets, originally a volcano. St. Paul's rocks are volcanic, much altered. Fernando Noronha, the Tristan d'Acunha group, Marion Island, the Crozets, Kerguelen Island, and Heard Island are all of volcanic origin. Tongatabu (Friendly Group) is a coral island. Information is given as to the oceanic deposits (with table). R. E., Jun.

Palgrave, W. Gifford. West-Indian Memories.—The Lesser Antilles and the "Boiling Lake." *Macmillan's Magazine*, vol. xxxv. no. 209 (March), pp. 361–374.

Describes the islands. Refers to the Soufrières or solfataras general throughout the whole range of the Antilles, from Saba to Tobago, and describes the principal of those, the "*Grande Soufrière*," and the Boiling Lake close by, both in the Island of Dominica. The Soufrière is a half-extinct crater, giving off gaseous and sulphurous emanations, together with outpourings of boiling waters, which unite into a torrent known as the "Sulphur River." The cliffs surrounding the Boiling Lake are about 100 feet high. E. T. H.

Schelle, C. J. van. Sumatra's-Westkust. Verslag no. 9. Over het voorkomen van ijzer- en kopererts bij het dorp Paningahan, xx kotta's. [Occurrence of Ores of Iron and Copper near Paningahan, Sumatra]. *Jaarb. Mijn. Ned. O.-Ind.* vol. 1, pp. 8–19; 2 geol. maps and several sections.

Swindells, Rupert. A Summer Trip to the Island of St. Michael, the Azores. Pp. viii, 172; pls. 8vo. *Manchester*. (Privately printed.)

Geological references, pp. 30–33, 35, 36; hot-springs, pp. 72–77; Analyses of waters of hot springs, pp. 144–152.

Thomson, Prof. Sir C. W. Sketches by the Way. *Good Words*, Feb. pp. 120–125; May, pp. 296–299.

1. *The Falkland Islands.*—The whole of the E. Island, and probably the greater part of the W. also, consists of Palæozoic sedimentary rocks—in the low grounds, clay slate and soft sandstones; on the ridges, hardened sandstones passing into white quartzites. The soft sandstones are highly fossiliferous; and the whole series possibly belongs to the base of the Devonian. The great "store rivers" of the Falkland Islands are described.

2. *Ascension.*—The island is purely volcanic; and although there are no active volcanic phenomena, the appearance of all the deposits leads to the belief that, geologically speaking, they are of no great age. R. E. jun.

Verbeek, R. D. M. Sumatra's-Westkust. [West Coast of Sumatra.] Verslag No. 10. Geologische Beschrijving van de Landstreek tusschen Siboga en Sipirok, residentie Tapanoli, Gouvernement Sumatra's-Westkust. [Geological Description of the Region between Siboga and Sipirok]. *Jaarb. Mijn. Ned. O.-Ind.* deel 1, pp. 21–37 (with a geol. map by **J. Th. R. Nagel** and **F. Schliep**; and view of Tapanoli Bay).

Contains observations on:—1. Granite; 2. Quartz-porphyry; 3. Slate, Sandstone, and Chalk; 4. Eocene Sandstone with Coal; 5. Andesite; 6. Volcanic products; 7. Recent depositions; and 8. Concluding remarks.

——. [The same.] Verslag no. 11. Ijzererts bij den Goenoeng-Bessi, in de Nabijheid van fort van der Capellen, afdeeling Tanah-Datar, residentie Padangsche Bovenlanden. [Iron-ores near Goenoeng-Bessi.] *Jaarb. Mijn. Ned. O.-Ind.* deel 1, pp. 39–44, section and geol. map.

Verbeek, R. D. M. [The same.] Verslag no. 12. Kolen bij Indrapoera. [Coal from near Indrapoera.] *Jaarb. Mijn. Ned. O.-Ind.* deel 1, pp. 45–50; 2 geol. maps by **Nagel** and **Schliep**.

——. [The same.] Verslag no. 13. De Vulkaan Atar. [Volcano of Atar.] *Jaarb. Mijn. Ned. O.-Ind.* deel 1, pp. 51–67, geol. map and 2 sections.

——. Ueber die Gliederung der Eocänformation auf der Insel Borneo. [Systematic arrangement of the Eocene of Borneo.] *Jaarb. Mijn. Ned. O.-Ind.* deel 2, pp. 15, 16, map.

——. Voorloopig Verslag over een geologischen Verkenningstocht door Bengkoelen en Palembang, gedaan in de maanden Mei tot December, 1876. [Geological Journey of Exploration through Benkoelen in 1876.] *Jaarb. Mijn. Ned. O.-Ind.* deel 2, pp. 111–135.

Coal discovery at Benkoelen and at Palembang.

——. Over een onderzoek naar Kolen aan de rivier Sepoeti, in de residentie Lampongsche districten, Sumatra's-Zuidkust. [Search for Coal on the River Sepoeti, S. Coast of Sumatra.] *Jaarb. Mijn. Ned. O.-Ind.* deel 2, pp. 176–179, plates.

——. Verslag van het Mijnwezen in Nederlandsch Oost-Indië over het jaar 1876. [Report on the Mining Works in the Dutch East Indies, in 1876.] *Jaarb. Mijn. Ned. O.-Ind.* deel 2, pp. 180–189.

——. On the Geology of Sumatra. *Geol. Mag.* dec. ii. vol. iv. pp. 443, 444; pl. xiv.

Gives a panoramic view of the Oembilien Coal-field, including the smaller fields of Parambahan, Sigaloet, and Soengei-Doerian; and a summary of the papers by Prof. H. B. Geinitz and Dr. W. v. D. Marck. (See Geological Record for 1876, pp. 168, 261.) R. E., Jun.

Verbeek, R. D. M., Dr. O. Bottger, Dr. Th. Geyler, and Dr. C. von Fritsch. Die Eocänformation von Borneo und ihre Versteinerungen. [Eocene of Borneo and its Fossils.] *Jaarb. Mijn. Ned. O.-Ind.* vol. 2, pp. 11–14.] (See Geological Record for 1875, p. 299.)

Weld, His Excellency F. A. Reminiscences of a visit to the Volcanoes of Hawaii. *Papers and Proc. R. Soc. Tasm.* for 1876, pp. 118–130.

Gives a general description of the Sandwich Islands, and of Mawé and Hawaii in particular. Notices the principal outbreaks from the volcanoes of the latter, and describes in detail that of Mauna Loa, and Mauna Kilauea in 1855. The craters were visited during full activity. R. E., Jun.

SUPPLEMENT FOR 1874–1876.

Centeno y Garcia, José. Memoria Geológico-Minera de las Islas Filipinas. [Geology and Mineralogy of the Philippine Is.] *Bol. Com. map. Geol. Españ.* t. iii. pp. 181–234, pl. B (map). [1876.]

Part 1 deals with Orography, Volcanoes, Thermal Springs (analyses), and Stratigraphy (of each island separately). *Lepanto*: Eocene, with Copper Ore and Igneous Rocks. *Pangasinan* and *Pampanga*: Post-pliocene and Volcanic Rocks. *Luzon* and *Cebu*: Coal?, Carboniferous and other rocks not described. Part 2 (mineralogical) is divided into Carbon, Iron, Copper (analyses of arsenical pyrites by **Santos**), Gold, Mercury, Lead, Antimony, and Sulphur. W. H. D.

Drasche, Dr. Richard v. Ausflüge in die Vulcangebiete der Umgegend von Manila. [Volcanic District of Luzon.] *Verh. k.-k. geol. Reichs.* pp. 89–93. [1876.]—Mittheilungen aus den Philippinen. *Ibid.* pp. 193–198. [1876.]—Aus dem Süden von Luzon. *Ibid.* pp. 251–255. [1876.]

From letters by **Von Hauer**. Luzon consists of syenite, trachyte, andesite, talcose schists, tuffs, sandstones, and lignitiferous marls. Coral reefs occur at several points inland. W. H. D.

——. Mittheilungen aus Japan. [Notes on Japan.] *Verh. k.-k. geol. Reichs.* pp. 306–308. [1876.]

From a letter of **Von Hauer**. Describes the active volcano Asama Jama and the surrounding district.

Filhol, H. Mission de l'île Campbell, constitution géologique de l'île. [Geology of Campbell Island.] *Compt. Rend.* t. lxxxii. p. 202. [1876.]

Heurteau, Emile. Rapport . . . . . sur la constitution géologique et les richesses minérales de la Nouvelle Calédonie. [Geology and Mineral Wealth of New Caledonia.] *Ann. Mines*, sér. 7, t. ix. pp. 232–454, pls. vii.–x. [1876.] Abstract noticed in GEOLOGICAL RECORD for 1876, p. 169.

Gives a general description of the geological constitution of New Caledonia, which is compared with that of New Zealand. Comments upon the Gold and Copper mines, and upon the Iron and its associated metals, chromium and nickel, giving analyses. Describes the stratified and metamorphic rocks, giving an account of the Carboniferous strata, with their included Coal. Concludes with a catalogue of the minerals of the country contained in the Colonial collection. J. D.

Regnault, —. Excursion géologique aux Mines de Banca. [Banca Mines.] *Bull. Soc. Hist. Nat. Toulouse,* t. viii. p. 171. [1874.]

PHYSICAL GEOLOGY.

Sub-Editor F. Drew, F.G.S., Assoc. R.S.M.

1. *PHENOMENA OF UNDERGROUND ORIGIN.*

Anon. Le grand Tremblement de terre du Pérou. [Peru Earthquake.] *Rev. Sci.* t. xiii. pp. 18-20.

Note of earthquake on May 10, 1877. The sea-waves engendered drowned 600 people; and pulsation-waves with maxima every 80 minutes lasted till the 11th. G. A. L.

——. The Great Earthquake on the coast of Peru. *Geogr. Mag.* vol. iv. pp. 206-209.

A list of earthquakes recorded on the W. coast of S. America from 1570 to 1875, with a description of the great one of May 9, 1877.

——. Earthquakes reported in New Zealand during 1876. *Trans. N. Zealand Inst.* vol. ix. p. xxiii.

Arranged in tabular form.

——. Versuche und Verbesserungen bei dem Bergwerksbetriebe in Preussen während des Jahres 1876. *Zeit. Berg-, Hütt. Salinenw.* Band xxv. *Abhandl.* pp. 221-248. [Increase of Temperature in the Maria Mine, near Aachen, p. 241.] Abstract in *Proc. Inst. Civ. Eng.* vol. lii. p. 391.

The mine is 585½ feet above the sea. With a surface temperature of 55°·76 F., the temperature at 1844 feet was 75°·56; that of the air at that depth being 78°·8. W. T.

——. **[A Geologist.]** The Internal Heat of the Earth. A general Statement of the Case. *Gardener's Chronicle,* Dec. 22, pp. 642-647, woodcuts.

Becquerel, —. Observations de température faites au Muséum d'Histoire naturelle, pendant l'année 1876, avec des thermomètres électriques placés à des profondeurs de 1 mètre à 36 mètres sous le sol, ainsi que dans l'air, et sous des sols gazonnés et dénudés. [Temperature Observations at Depths of from 1 to 36 metres, in air, and beneath turfed and bare soils.] *Compt. Rend.* t. lxxxiv. pp. 515-520.

According to the annual means for 11 years, between 1 and 36 metres, the rate of increase with depth indicated is 1° C. for 30 metres. As a mean also the temperature has been found slightly higher in turfed than in unturfed soil. G. A. L.

Cochrane, Charles. Effects of Heat on the Sand beneath Blast Furnace Hearths. *Proc. Dudley Geol. Soc.* vol. 3, no. 3, pp. 54, 55.

The sand in which the stones of the hearths are bedded is converted into hard ragstone with prismatic columnar structure.

Croll, J. On the Tidal Retardation Argument for the Age of the Earth. *Rep. Brit. Assoc.* for 1876, *Sections*, pp. 88, 89.

Opposes Sir W. Thomson's argument (derived from Tidal Retardation and the Figure of the Earth) that it cannot have been many millions of years ago that solidification took place, by the consideration that subaerial denudation, being greater in the equatorial regions, must have been lowering the equator rapidly; consequently we cannot infer from the present form of the globe what was its form when it solidified. Also, this transference of material from the equator to higher latitudes must tend to lessen the rate of tidal retardation. F. D.

Dawson, J. W. The Earthquake of November 4, 1877. *Canad. Nat.* n. ser. vol. viii. no. 6, pp. 342–345.

It has been noticed that in previous earthquakes the greatest intensity of the shocks appeared near the junction of the Laurentian with the Silurian; but in the earthquake described this seems to have applied chiefly to the border of the Laurentian, extending round by the Ottawa and Kingston to the Adirondacks. R. B. N.

Dijk, P. van. Naschrift op de verhandeling over de wet der Geothermische Progressie. [Law of Geothermal Progression.] *Jaarb. Mijn. Ned. O.-Ind.* deel 2, pp. 137–144.

Dorn, Ernst. Beobachtungen der Station zur Messung der Temperatur der Erde in verschiedenen Tiefen im botanischen Garten zu Königsberg i. Pr. Januar bis December 1876. [Measurement of Earth Temperatures.] *Schrift. phys.-ökon. Ges. Königsberg*, Jahrg. 18, *Abhandl.* p. 169.

Dunker, G. Ueber die möglichst fehlerfreie Ermittelung der Wärme des Innern der Erde und das Gesetz ihrer Zunahme mit der Tiefe. [The Determination with least risk of error of Underground Temperature and the Law of its Increase with Depth.] *N. Jahrb.* Heft vi. pp. 590–606.

A depth has never been reached where the underground temperature decreases or ceases to increase with the depth; but the determination of the law of increase is difficult. An empirical formula $t = A + Bd + Cd^2$ may be assumed, where t is the temperature at a depth d, and A, B, C are constants to be determined from the observations by the method of least squares. A formula of this kind was deduced from the observations taken in the deep borehole No. 1 at Sperenberg, near Berlin (see 'Nature,' vol. xv. p. 242); this formula is now rejected, and fresh formulæ are given instead. The majority of observations make C negative, which amounts to this, that the increments of temperature for equal increments of depth get smaller as we go down, so that at a certain depth, not very great, the underground temperature reaches a maximum, and below that begins to decrease. The interior of the earth, according to this showing, cannot have a high temperature (see **Prof. Mohr,** GEOLOGICAL RECORD for 1875, p. 177); but the observations on which this conclusion is based are not trustworthy enough to allow of its being accepted. The author knows only of 4 cases in which the observations were taken with care enough to allow of their being used to determine the law of the increase of underground temperature. A discussion of the observations in these cases gives C sometimes positive and sometimes negative, but always so small when compared with B that it may be neglected, its presence being very likely due to errors of observation. The most likely result is that the increase of temperature is directly proportional to the increase in depth. A. H. G.

Everett, Prof. Ninth Report of the Committee appointed to investigate Underground Temperature. *Rep. Brit. Assoc.* for 1876, pp. 204–211.

Gives the results of observations in a boring at Sperenberg, 4172 feet deep, chiefly in rock-salt. The mean rate of increase (to 3390 feet) is 1° F. for 51·5 feet; there are some variations not easy to explain. Observations in coal-pits at Anzin, France, showed a mean rate of increase from 28·1 to 47·2 feet for 1° F.; some disturbing influences are here pointed to. In the Kentish-Town well, observations to determine the temperature-changes at 1000 feet depth show that from month to month hardly any change occurs. Methods of plugging bore-holes to prevent convection are discussed. F. D.

Fuchs, C. W. C. Bericht über die vulkanischen Ereignisse des Jahres 1876. [Report on the Volcanic Phenomena of 1876.] *Min. Mitth.* Heft i. pp. 83–94.

There was no great volcanic eruption during the year. Vesuvius showed signs of activity; and ashes, largely associated with ammoniacal salts, were shot forth in April. Etna was uneasy in the early part of the year; and the seismograph was constantly agitated during the first half of April. There was an eruption of lava at Mauna Loa, Sandwich Island, on August 11. On the Islands of Loss, near the W. shore of the Caspian, a violent mud eruption occurred. 104 earthquakes are recorded during the year 1876. These occurred on 95 different days. The most violent was in Peru on January 4 and 5, when the town of Abencay was destroyed. F. W. R.

Goddard, C. V. Volcanoes and Earthquakes. *4th Rep. Winchester Coll. Nat. Hist. Soc.* pp. 46–51.

Notices the distribution and results of the phenomena.

Gumælius, O. Om jordstöten den 5 Mars, 1877. [The Earthquake on March 5, 1877, in Sweden]. *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 341–346.

Reports from different places as to the intensity and duration.

Haughton, Rev. Dr. S. Notes on Physical Geology. *Proc. R. Soc.* vol. xxvi. pp. 51–63, 401.

1. Preliminary formulæ, relating to the internal change of position of the earth's axis, arising from elevations and depressions caused by geological changes. 2. On the amount of shifting of the earth's axis already caused by the elevation of the existing continents. R. B. N.

Hébert, E. J. Reversed Faults in Bedded Slates. *Geol. Mag.* dec. ii. vol. iv. pp. 441–443.

Where the vertical pressure on a mass of rock exceeds the horizontal, motion takes place down the slope of oblique cracks; but where, as in cleaved rocks, the horizontal exceeds the vertical pressure, the reverse or upward motion is produced. W. H. D.

Heinrich, F. Ueber die Temperaturen im Bohrloche zu Sperenberg und die daraus gezogenen Schlüsse. [Temperatures in Sperenberg Boring.] *Zeitschr. Berg-, Hütt. Salinenw.* Bd. xxv. *Abhandl.* pp. 58–62. Abstract in *Proc. Inst. Civ. Eng.* vol. lii. pp. 388–390.

——. Ueber die Temperaturen in dem Bohrloche zu Sperenberg und die darüber angestellten Rechnungen und Schlüsse. [Sperenberg Boring.] *N. Jahrb.* pp. 897-905.

Hermite, —. Sur l'unité des forces en Géologie. [Unity of Forces in Geology.] *Compt. Rend.* t. lxxxiv. pp. 459–461, 510–512.

Gives reasons for regarding the constantly increasing weight of deposits in areas of subsidence as the chief factor of geological change. To it are referred the stratigraphical disturbances of mountain-chains, lateral pressure, and even the origin of volcanic eruptions. G. A. L.

Herschel, Prof. A. S., and G. A. Lebour. Third Report of a Committee on Experiments to determine the Thermal Conductivities of certain Rocks, showing especially the Geological Aspects of the Investigation. *Rep. Brit. Assoc.* for 1876, pp. 19–27.

Gives a detailed account of the method of applying the thermopile to this inquiry. A table of the results of the new experiments shows the conductivity of 25 varieties of rock. Rock salt has the highest; quartz the next. The fact that slate has greater conductivity parallel to the cleavage-planes than across them is confirmed. The lightest species of rocks, pumice-stone and Newcastle house-coal, have the lowest conductivity. F. D.

Hoefer, Prof. H. Das Erdbeben von Belluno am 29. Juni 1873. [Earthquake of Belluno.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Bd. lxxiv. pp. 819–858; plate (map) and cut.

Instead of taking the homoseistic curves as circles, they were drawn according to time-data observed at 13 reliable stations; the homoseist of 5 A.M. was thereby found to be a lobed figure extended in N.W., S.E., and E. directions, as if formed by two ellipses crossing at the epicentre (but not extending W. of it) at an angle of 60°; the axes of these curves correspond with two fissures, along which motion proceeded easier than in other directions: one is the line of the Adriatic produced northwards; the other, termed the Laibach fissure, is a marked orographic line: *e. g.*, it is the S. boundary of the Rhætic formation, and has S. of it no elevations above 4000 feet, but N. of it up to 8000 feet. The cause was not volcanic, but a centripetal one. E. B. T.

Hottenroth, Fr. Ueber das Gesetz der Temperaturzunahme nach der Tiefe unter zu Grundlegung der Dunker'schen Beobachtungen im Bohrloch zu Sperenberg. [Law of the Increase of Temperature with the Depth, as deduced from the observations of Dunker in the Sperenberg Borehole.] *N. Jahrb.* pp. 607-615.

Heinrich states (see pp. 173, 178) that if the depths at which observations were taken in the Sperenberg boring be represented by abscissæ, and the corresponding temperatures by ordinates, the extremities of the ordinates lie in a straight line; and hence he concludes that the increase of temperature corresponding to any increase of depth varies as the first power of the increase in depth. The author points out that, if the abscissæ and ordinates be drawn to the same scale, the line of temperature cannot be distinguished by the eye from a straight line; but, if the scale for the ordinates be much larger than for the abscissæ, the line joining their extremities forms a polygon, and that the eye alone cannot say whether it approximates more nearly to a straight line or a parabola. Concludes that the graphical method is of no value, and deduces a formula on the assumption that the curve of temperature is a parabola. The result he considers more trustworthy than Heinrich's, because the sum of the squares of the differences between the observed and calculated temperatures is less in this case. The term involving the square of the depth is negative; the temperature therefore increases as we go down at a diminishing rate, reaches a maximum, and then decreases; and consequently the interior of the earth cannot have a high temperature. Admits that the observations at Sperenberg are not sufficient to establish this view, but thinks they support it. A. H. G.

Keatinge, R. H. Record of the Occurrence of Earthquakes in Assam during the years 1874, 1875, 1876. *Journ. As. Soc. Bengal*, vol. xlvi. pt. ii. pp. 294-309.

Gives the time of occurrence, the duration, and the extent of damage.

Kinahan, G. H. On Metamorphism and Vulcanicity. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 59-67.

Applies the new term *Metapepsis* to metamorphism by hydrothermal action, and *Paroptesis* to the effect of dry heat. The former is regional, the latter local. W. H. D.

Mallet, R. On an hitherto unnoticed circumstance affecting the piling-up of Volcanic Cones. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 740-748.

From the comparative looseness of the materials which compose volcanoes, and which in many cases constitute the mass of the ground beneath them, there must often be a settlement or sinking beneath the centre of the mountain where the pressure is greatest. This may cause an inward dip of the volcanic strata of the lower part of the cone. The honeycombing or evisceration beneath such mountains tends in the same direction. The Val del Bove and other cavities are referred to this latter cause. F. D.

Mallet, R. On the Conversion of Geyser-throats in Iceland into Volcanic Vents. *Phil. Mag.* vol. iii. pp. 108, 109.

From the description of an eruption of the volcano Trölladyngja, Iceland, in 1875, draws an argument to support his views as to the "Mechanism of Stromboli." F. D.

——. On the Seismic Results obtained from the Hallet's-Point Explosion. *Phil. Mag.* vol. iv. pp. 298–302.

Thinks that the conditions of the explosion were not calculated to give a correct determination of the velocity of a seismic wave. Gives reasons for doubting the accuracy of the numbers given. F. D.

Medlicott, H. B. Observations on Underground Temperature. *Rec. Geol. Surv. Ind.* vol. x. pp. 45–48.

Records observations at depths up to 350 feet at three places in the Satpura Coal-field in India. Those with fewest disturbing circumstances gave an increase, from a constant temperature of 81° F. at 60 feet deep, at the rate of 1° for every 66 feet of depth. F. D.

Moesta, C. W. Ueber die Zunahme der Temperatur des Erdkörpers mit der Tiefe, abgeleitet aus den Beobachtungen, welche in dem Bohrloche zu Sperenberg angestellt sind. [Increase of Underground Temperature with the Depth, deduced from Observations in the Sperenberg Borehole.] *N. Jahrb.* pp. 187–189.

Assumes as an empirical formula for the temperature T at a depth S, $T = a + \alpha S e^{\beta S + \gamma S^2}$, and states that, when the constants a, q, β, γ are determined by the method of least squares from the 7 most trustworthy observations, there is a close agreement between the observed and calculated temperatures. A. H. G.

Peacock, R. A. What is, and what is not, the Cause of Activity in Earthquakes and Volcanoes. Pp. 23, map. 8vo. *London.* Price 1*s.*

Argues that steam, and not the heat produced by rock-crushing, is the chief source of volcanic energy.

Reyer, Dr. E. Beitrag zur Fysik der Eruptionen und der Eruptiv-Gesteine. [Physics of Eruptions, &c.] Pp. xv, 225; 6 pls. 8vo. *Vienna.*

I. Cites the absorption by fused metals and their intumescence on cooling, and concludes that the fluid interior of the earth can similarly absorb gases and also liquids. The condition of the moon is considered;

its volcanoes, devoid of ash-cones, are compared with cooled metals, *e. g.* cast steel, the re-absorption of the intumescing gases being accounted for.

II. Pp. 94–149. Treats of the fluid internal magma, and the relation of pressure to crystallization; that the earth is mainly solid is admitted, and that pressure tends to solidify the magma, or a relief of pressure to aid its fluidity, and so its rising through fissures. The coarsely crystalline rocks were formed at greater pressure than the finer-grained ones, while the production of crystals in the acid rocks requires a far higher pressure than in the basic series: age has therefore nothing to do with formation of coarsely crystalline rocks, *e. g.* granite; it is an accident due to denudation that they are more known in older formations.

III. Pp. 149–220. Remarks on the classification of rocks by their mineral contents and texture combined, age not being admitted as a factor; the passages between types are referred to, while the existence of these types is held to lie in the affinities of the elements, and consequent predominance of specific combinations. E. B. T.

Sollas, W. J. On Evolution in Geology. *Geol. Mag.* dec. ii. vol. iv. pp. 1–7.

The cooling of sun and earth lessens rainfall and tides, and therefore lessens denudation and deposition; the storing of carbonic acid in limestone, &c. prevents its action on silicates; oscillations are lessened in speed by the increasing thickness of the crust. That is, geological changes proceed with decreasing rapidity, and the present rate is not to be applied to all past time. W. H. D.

Stevenson, D. Notice of Recent Earthquake Shocks in Argyllshire. *Proc. R. Soc. Edinb.* vol. ix. no. 98, pp. 403–405.

Thomson, Sir W. Geological Climate. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 238–250, map.

There is "no evidence in Geological Climate throughout those parts of the world which geological investigation has reached to give any indication of the poles having been anywhere but where they are at any period of Geological Time." "The one hypothesis of all suggested that has received no favour from any professed geologist is that of a warmer sun—the one hypothesis that is rendered almost infinitely probable by independent physical evidence and mathematical calculation."
R. B. N.

—— Address to the Section for Mathematics and Physics. *Rep. Brit. Assoc.* for 1876, *Sections*, pp. 1–12.

A review of evidence regarding the physical conditions of the earth, its internal temperature, the fluidity or solidity of its interior substance, the rigidity, elasticity, plasticity of its external figure, and the permanence or variability of its period and axis of rotation. F. D.

Toula, F. Ueber den Bau und die Entstehung der Gebirge. [Formation and Composition of Mountains.] *Schrift. Ver. Nat. Kenntn. Wien*, Bd. xvii.

Tschermak, G. Ueber den Vulcanismus als kosmische Erscheinung. [Cosmical Vulcanicity.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Bd. lxxv. pp. 151–176. Noticed in *Phil. Mag.* vol. iii. pp. 316–318.

Notices the explanation of volcanoes by access of water to heated rock, but remarks that it could not apply to the moon or meteorites; nor is Mallet's theory possible, for the heat would be spread over the mass moved, and could not reach the fusing-point, neither would it account for the chemical concomitants. Nasmyth and Carpenter's theory is insufficient. Angelot's idea of occluded gases in a fluid interior which are released on solidification is favourably regarded. It is calculated that, if half the heat lost annually by the earth through cooling be radiated from the interior, and the other half be developed by contraction, 190 cubic kilometres would solidify yearly, supposing it to be of cast iron. If this were to give off 50 times its volume of gases, it would account for the maintenance of 20,000 volcanoes. This theory has the advantage of adapting itself to the phenomena of meteorites, the state of the sun, &c. E. B. T.

Vessi, —. [On Seismic Movements in the Valley of Chiana, and their Influence on the Hydrographic Condition of the Valley of the Tiber.] *Rend. R. Ist. Lomb.* vol. xi.

Waters, A. W. Inquiries concerning a Change of Position of the Earth's Axis. *Proc. Lit. Phil. Soc. Manch.* vol. xvi. p. 171.

From the subtropical character of the Arctic fossil flora, the theory of movement of the poles has been inferred. Elevations and depressions or denudation can have but little effect; but that little may be cumulative. W. H. D.

See also :—

Daubrée, Prof. A. Volcanic action, cleavage, &c.: *post*, under *Science Conferences*, at end of MISCELLANEOUS.

Naumann, E. Eruption of Ooshima: p. 143.

Rossi, —. Italian Vulcanicity: p. 113.

SUPPLEMENT FOR 1874–1876.

Cossigny, — de. Considérations sur les Failles et les Soulèvements ; réfutation de la prétendue nullité du Soulèvement du Sancerrois. [Faults and Upheavals. Proof of the Upheaval of the Sancerrois.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 453–458. [1876.]

Regards faults as produced first by the fissuring of the earth's crust without vertical movement, which is subsequently produced by lateral pressure to which each part of the crust yields independently, the resulting anticlinals being all in the same direction. W. H. D.

Dufet, —. Déformation des Fossiles contenus dans les roches schisteuses. [Distortion of Fossils in Slaty Rocks.] *Compt. Rend. Assoc. Franç.* sess. 4, p. 576. [1876.]

Fisher, Rev. O. On the Effect of Convective Currents on the Distribution of Heat in a Borehole. *Trans. Camb. Phil. Soc.* vol. iii. pt. i. pp. 14–16. [1876.]

Doubts the reliability of the results obtained in the Sperenberg borehole.

Fitch, Dr. T. A. Springs. *Scientific Monthly*, August 1876, plate (mud volcano).

Fuchs, K. Les volcans et les tremblements de terre. [Volcanoes and Earthquakes.] 8vo. *Paris.* [1876.] Ed. 2 in 1877 or 1878.

Gurlt, —. Ueber den Zusammenhang zwischen Quarzporphyr und jüngerem Granit und den durch letzteren bewirkten Metamorphismus der Silurschichten im südlichen Norwegen. [Relation of the Quartz-porphyry and younger Granite to the Metamorphism of the S. Norwegian Silurian.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. i. *Sitzungsb.* pp. 228, 229. [1874.]

Heinrich, F. Ueber die Temperaturen im Bohrloche zu Sperenberg und die daraus gezogenen Schlüsse. [Temperatures in the Sperenberg Borehole, and Conclusions drawn therefrom.] *N. Jahrb.* pp. 716–723. [1876.]

Controverts Mohr's conclusion that the increase of temperature for a given increase of depth gets less and less as we go down. (See GEOLOGICAL RECORD for 1875, p. 177.) Objects to the formula obtained by Dunker for the temperature at any depth, and, assuming that the increment of temperature is always proportional to the increment of the depth, deduces a new formula. A. H. G.

Jannettaz, Ed. De la propagation de la Chaleur dans les corps ; de ses relations avec 1° la structure des minéraux, 2° le métamorphisme des roches. [Thermal Conductivity in respect of Mineral Structure and Metamorphism.] *Bull. Soc. Géol. France.* sér. 3, t. iii. pp. 499–510, pl. xiv. [1875.]

The curve indicated by the unequal conductivity of cleaved rocks and minerals is an ellipse whose longer axis coincides with the cleavage. Lines of stratification and crystal-growth do not affect these curves, which in uncleaved bodies are circles. The elliptic Newtonian rings are similar curves. In contorted masses the axis of the ellipse follows the contortions. The bearing of these facts on calculations of the transmission of volcanic heat is pointed out, and the method of measuring the curves is shown. W. H. D.

Laurance, J. The Phenomena of Volcanoes and Earthquakes. *Trans. Leicester Lit. Phil. Soc.* pt. ii. pp. 50, 51. The Causes of Volcanoes and Earthquakes. *Ibid.* pp. 57, 58. [1876. Read 1840.]

Mallet, R. Ueber vulkanische Kraft. [Volcanic Energy.] Translated (with comments) by **A. v. Lasaulx.** *Verh. nat. Ver. preuss. Rheinl.* ser. 4, Bd. ii. pp. 124–271. [1875.]

Niles, Prof. W. H. Geological Agency of Lateral Pressure exhibited by certain Rock movements. *Proc. Boston Soc. Nat. Hist.* vol. xviii. pp. 272–284. [1876.]

The present activity of lateral pressure is evidenced in places by movements of rock and associated phenomena.

Orloff. [Earthquakes generally and Earthquakes in S. Siberia.] In Russ. 4to. *Kasan.* [1876.]

Powell, Major J. W. Types of Orographic Structure. *Amer. Journ.* ser. 3, vol. xii. pp. 414–428. [1876.]

A portion of the work noticed in the GEOLOGICAL RECORD for 1876, p. 139. 11 mountain forms are described.

Ridding, Rev. Dr. G. Introductory Address, delivered at the commencement of the Seventh Session. *Journ. Winchester Sci. Soc.* vol. ii. pt. 2, pp. 73–105. [1876.]

Remarks on the consolidation of the earth, the origin and dislocation of rocks, and evolution.

Sorby, H. C. Impressed Limestone Pebbles, as illustrating a New Principle in Chemical Geology. *Rep. Cardiff Nat. Soc.* for 1873, pp. 21–25, plate. [1874.]

Reviews various theories accounting for the way in which limestone pebbles in conglomerates are sometimes deeply impressed one into the other. Believes the result due to a combination of mechanical and chemical force. The solubility of salts is increased by pressure. In the case of a pebble pressed with considerable force against a limestone pebble surrounded with water saturated with carbonate of lime, the water would dissolve an extra quantity of the carbonate of lime at the point of contact, and by diffusion remove it to where the pressure is less. T. V. H.

Vogt, Carl. Les volcans. [Volcanoes.] *Compt. Rend. Assoc. Franç.* sess. 2, pp. 1035–1055. [1874.]

2. *SURFACE PHENOMENA.*

Anon. Sea-Spoil. *Chambers' Journal* No. 720, Oct. 13, pp. 648–650.

An account of recent changes of the coast-line in England and elsewhere.

Beasley, Henry C. Some notes on Surface sculpture. *Proc. Liverpool Geol. Soc.* vol. iii. pt. iii. pp. 243–245.

Describes the action of frost and rain on the peaked scarps of Wansfell, near Windermere.

Bouquet de la Grie, —. Sur la détermination de la quantité de vase contenue dans les eaux courantes. [Determination of the Amount of Mud suspended in Running Water.] *Compt. Rend.* t. lxxxv. pp. 778, 779, figure.

Description of an instrument used for this purpose at La Rochelle, and called the "Pelometer." It can be read at night by untrained assistants. G. A. L.

Campbell, J. F. On Himalayan Glaciation. *Journ. As. Soc. Bengal,* vol. xlvi. pt. ii. pp. 1–10.

Compares the stones and form of ground along the edge of the Himalayas with those observed in other countries, from which the action of ice has been inferred. Sees nothing here which could not have been produced by running water. Especially examined the Kángrá hills, and found no mark of glacial action. [See **Medlicott,** p. 181.] F. D.

Fuchs, Th. Ueber die Grundform der Erosionsthäler. [Valleys of Erosion.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. Heft 4, pp. 453–457; 4 cuts.

Gives figures of an ideal erosion-valley: shows that it is pear-shaped, or wider above and narrower below; next of ideal action of erosion on a sphere from which would be produced by radiating erosion-valleys a central mountain with diverging spurs. Contends that these forms are everywhere seen in Nature, that all valleys are erosion-valleys, and that the relief of the ground even in mountain-ranges is due to this action. Examples of forms of valleys in New South Wales, cañons of America, &c. cited as evidence. E. B. T.

Geikie, James. The Great Ice Age. Ed. 2, pp. xxx, 624; 19 pls. (maps, charts, and views). 8vo. *London.* (Ed. 1 noticed in the Geological Record for 1874, p. 175.)

The changes are:—a revision of the account of the till of Scotland; the account of the glacial deposits of England almost entirely re-written; some additions to the information on Ireland, Sweden, Switzerland, and Italy; a more detailed discussion of the glacial deposits of N.

America, and an account of the glacial and interglacial deposits of the Fenland (by **S. B. J. Skertchly**). F. D.

Greenwood, Col. G. River Terraces. Pp. xx, 247. 8vo. *London.*

A collection of letters chiefly on the subjects of Rain and River action, Lakes, and River Terraces.

Hofer, Prof. H. [Fall of Rock.] *N. Jahrb.* Heft iv. pp. 621, 622.

The testimony of a competent witness of the great fall of rock near Steinbrück, in Lower Styria, contradicts the report that it was accompanied by a luminous phenomenon like lightning. [See **Rolle**, p. 182.] F. W. R.

Kidd, H. W. Note on a probable Cause of Faults in Limestone. *Sci. Goss.* vol. xiii. p. 187.

Suggests that the removal of limestone by carbonated water must cause unequal subsidence of overlying rocks.

Medlicott, H. B. Note on Mr. Campbell's paper on Himalayan Glaciation [see p. 180.] *Journ. As. Soc. Bengal,* vol. xlvi. pp. 11–13.

Agrees with Mr. Campbell in denying the extreme theory of the extension of glaciers in the Kángrá District; but thinks that some of the largest transported blocks may have travelled with the aid of ice. *Some* former extension of the present glaciers having been proved for different parts of the Himalayas, it probably affected the mountains behind Kángrá also. F. D.

Milne, Prof. J. On the action of Coast-Ice on an oscillating area. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 929–931.

From observations on the action of coast-ice in Newfoundland, Labrador, and Finland, concludes that much of the moulding and scoring attributed to an ice-cap was done by coast-ice on a rising area. There is a continuity in contour between the undulations along the margin of the water (known to have been produced by coast-ice) and those at higher levels. The view is corroborated by the fact that the general direction of ice-markings in N. Europe is more or less at right angles to the coast. F. D.

Péroche, J. Les phénomènes glaciaires et torrides, etc. [Glacial and Heat Phenomena.] 8vo. *Paris.*

Ploix, Edmond. Rapport sur la reconnaissance de Boulogne. Recherches hydrographiques sur le régime des côtes. 7me cahier. (Dépôt des Castes et Plans de la Marine.) Pp. vii, 65; 13 pls. 4to. *Paris.*

In pages 33 and 34 is some information on the quantity and nature of the material held in suspension by the sea water.

Poliakoff. On bed of River Irtysh. *Nature,* vol. xv. p. 207.

The river obeys the law of Baer, as to the deviation to the right of rivers running N. and S.; as the river cuts back the right bank, the villages advance E. Demiansk has thus shifted about a mile in 240 years. C. E. R.

Reade, T. M. President's Address. *Proc. Liverpool Geol. Soc.* vol. iii. pt. iii. pp. 211–235.

The mean rainfall of England and Wales is 32 inches a year; the mean depth run off the ground is 18·3 inches, removing from the surface no less than 8,370,630 tons of solids, in solution, or ·093 of an inch a century, or 12,978 years to denude England and Wales of a foot of matter soluble in rain-water. Similar facts are collected as to other parts of the world, and similar deductions drawn, the ocean being regarded as a mechanical distributor of matter. To cover the globe with a deposit 10 miles thick, 526 million years would be required. C. E. R.

Richardson, Ralph. On Phenomena of Weather Action and Glaciation exhibited by the Alps of Switzerland and Savoy; being Notes of a Recent Tour. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 11–23; view of moraines.

Describes the till, moraines, and roches moutonnées of the Boden Glacier. The Glacier des Bois is rapidly melting away. There are three forms of Alpine mountains—the dome, pyramid, and obelisk. W. H. D.

——. On Phenomena of Glaciation exhibited by the Rocks of Corstorphine Hill, near Edinburgh. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 31–40.

Describes and discusses the glaciation of Corstorphine Hill, which must have been enveloped in ice. Figures a roche moutonnée on it and one in Switzerland for comparison. W. H. D.

Rolle, Dr. F. [Fall of Rock.] *N. Jahrb.* Heft iii. p. 276.

On Jan. 18, 1877, at 11 P.M., there occurred near Steinbrück, in Styria, a great fall of rock, accompanied by a luminous phenomenon like lightning. It is said that sudden light was also seen on the occasion of a great fall of ice and snow on the Weisshorn on Dec. 27, 1819. [See **Hofer**, p. 181.] F. W. R.

Somervail, Alexander. On the Glacial Phenomena of Scotland, with special reference to the recent Works of Dr. Croll and Mr. James Geikie. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 88–97.

The division of the lower Drift into till and boulder clay is unwarranted. The inter-glacial periods did not exist; and the cold of the Glacial Period has been much exaggerated. W. H. D.

Thomson, Prof. J. On the origin of Windings of Rivers in Alluvial Plains, with Remarks on the Flow of Water round Bends in Pipes. *Proc. Roy. Soc.* vol. xxv. p. 5.

At the inner bend of a river deposition of silt takes place from an obliquely transverse motion of the bottom water from above towards the inner side. This is caused by its centrifugal tendency being less than that of the surface water (from lessened velocity), and a consequently greater *fall of free level* along a stream-line parallel to the inner bank. F. D.

Thomson, Prof. J. Experimental Illustration of the Origin of Windings of Rivers in Alluvial Plains. *Rep. Brit. Assoc.* for 1876, *Sections*, pp. 31, 32.

Account of an experiment, proving the conclusions drawn in the paper noticed above.

Toula, F. Thalbildung. [Valley-formation.] *Schrift. Ver. nat. Kenntn. Wien*, Bd. xvii.

Wild, John J. Thallassa. An Essay on the Depth, Temperature, and Currents of the Ocean. With Charts and Diagrams. Pp. 140. 8vo. *London*.

Chap. vi. (pp. 122–140). The Bed of the Ocean. The sub-headings are:—Changes in the Distribution of Land and Water, Formation of Sub-oceanic Strata, Formation of Central Oceanic Plateaux, Formation of Areas of Elevation and of Depression, Formation and Transformation of Continents, Formation of Mountain Ranges and Submarine Ridges. Those parts of the sea-bed which are generally spoken of as steep or even precipitous have but a gentle slope. A depth of 1000 fathoms at 5 nautical miles from the shore gives only a slope of 11°; and this is exceptionally steep. W. T.

Woodward, [Dr.] Henry. Evidences of the Age of Ice. *Pop. Sci. Rev.* n. s. vol. i. pp. 105–118, pl. iii.; 4 woodcuts.

Describes the existing climatic conditions of the earth, and reviews the evidences of former colder climate. Is doubtful as to periodical alternation of warm and cold climates on the surface of the earth. Thinks that the glacial period was introduced and in great part caused by changes in physical geography, of which the diversion of the Gulf Stream was one. Believes that, if extra-mundane causes are also needful, the most reasonable is a slight increase in the obliquity of the ecliptic. W. T.

See also:—

Clessin, C. Amper Glacier: p. 105.

Helland, Amund. Ice-fjords of N. Greenland: p. 116.

Lewis, E. Denudations of Valleys, Long Island: p. 126.

Ricketts, Dr. C. Conditions of Glacial Period: p. 35.

Williams, W. M. Norwegian Glaciation, &c.: p. 103.

SUPPLEMENT FOR 1874 and 1876.

Andrews [Prof.] E. B. On the Erosion of Rocks. *Amer. Journ.* ser. 3, vol. xii. pp. 304, 305. [1876.]

Describes stream-action in Ohio, forming caves and cañons.

Grad, C. Sur le frottement des glaciers et érosion des vallées. [Glacial Erosion.] *Compt. Rend.* t. lxxviii. pp. 759–762. [1874.]

Glaciers protect rocks from frost-action, and can only polish the projecting parts of the bed of the valley. The intervening hollows formed before the existence of the glacier are not occupied by ice, but by *moraine profonde*, whilst channels are cut by subglacier streams. The glaciers therefore cannot form their valleys. W. H. D.

Gurlt, —. Ueber die Entstehungsweise der Fjorde. [Formation of Fjords.] *Verh. nat. Ver. preuss. Rheinl.* folg. 4, Bd. i. *Sitzungsb.* pp. 143–145. [1874.]

Kerr, Prof. W. C. On Frost Drift in North Carolina. *Proc. Ac. Nat. Sci. Philadel.* pp. 157, 158. [1876.]

Describes slopes of angular detritus produced by frost action on the underlying rocks. The mass travels down the slope.

Martins, —. Des moraines contenant des coquilles considérées comme moraines sous-marines. [Shell-bearing Moraines regarded as Submarine.] *Act. Soc. Helv. Sci. Nat.* ann. 59. [1876?]

Newberry, Prof. J. S. The Causes of the Cold of the Ice Period. *Pop. Sci. Monthly*, July 1876, pp. 11.

Regards changes of climate as due to cosmical rather than geographical causes, as suggested by Lyell, whose theory is examined.

Price, Eli K. The Glacial Epochs. *Proc. Amer. Phil. Soc.* vol. xvi. No. 97, pp. 241–276. [1876.]

Reviews the principal theories relating to glaciation, opposing them on theological grounds.

Robert, E. Sur les érosions qu'on doit attribuer à l'action des eaux diluviennes. [Erosive Action of Diluvial Waters.] *Compt. Rend.* t. lxxxii. pp. 1216–1218. [1876.]

Prefers cataclysmic to existing denuding agents, which are too feeble to excavate large gorges.

Shaler, Prof. N. S. Notes on the Cause and Geological Value of Variation in Rainfall. *Proc. Boston Soc. Nat. Hist.* vol. xviii. pp. 176–182. [1876.]

Rainfall varies from change in its distribution over the earth, its quantity being the same, and from differences in evaporation. It was greater in the immediate past than now. R. B. N.

Smith, Dr. R. A. On Causes preventing Smoothness of Ground. *Mem. Lit. Phil. Soc. Manch.* sér. 3, vol. v. pp. 223–227. [1876.]

Frost cracks the soil, the cracks widen and deepen, and grave-like mounds are produced.

3. *ROCK-FORMATION.*

Buchanan, G. Y. Note on the Manganese Nodules found on the Bed of the Ocean. *Proc. R. Soc. Edin.* vol. ix. pp. 287–289.

Occur in greater or less quantity all over the ocean-bed, but most abundantly in the Pacific. Of all sizes, from minute grains to masses of more than a pound weight. Forms nodular concretions round a nucleus, either a piece of pumice or a shark's tooth. The nodules from different localities vary greatly in composition, though in the same locality the composition is the same. Analyses are given. R. E., Jun.

Carpenter, Dr. W. B. On the Temperature of the Deep-Sea Bottom, and the Conditions by which it is determined. *Proc. R. Geogr. Soc.* vol. xxi. pp. 289–323.

Many points applicable to Geology are mentioned.

Dieulafait, L. [Origin of Boracic Acid in the Tuscan Suffioni.] *Ann. Chim. Phys.* ser. 5.

The boracic-acid vapours are due to the action of meteoric waters heated by volcanic agency on M. Tertiary salt-beds. As in evaporating sea water, so in the Stassfurt salt-beds, the borates are not deposited till after the carnallite. W. H. D.

Hosken, Henry. Notes on Coral Reefs [Santa Cruz]. *Geol. Mag.* dec. ii. vol. iv. pp. 71, 72.

Murray, John. On the Distribution of Volcanic Débris over the Floor of the Ocean; its Characters, Source, and some of the Products of its Disintegration and Decomposition. *Proc. R. Soc. Edin.* vol. ix. pp. 247–261.

An account of the observations, during the cruise of the Challenger, on the composition of the deep-sea mud, with special reference to the occurrence of volcanic débris, peroxide of manganese, native iron, and cosmic dust. The general conclusions are:—1. Volcanic débris, either in the form of pumice-stones, ashes, or ejected fragments, is universally distributed in ocean deposits. 2. Pumice-stones are continually being carried into the sea by rivers and rains, and are constantly floating on the surface of the ocean far from land. 3. The clayey matter in deposits far from land is principally derived from the decomposition of the feldspar in fragmental volcanic rocks, though in the Trade-wind region of the N. Atlantic the dust of the Sahara contributes much material. 4. The red earth of Bermuda, Bahamas, Jamaica, and other limestone-countries is probably derived from the decomposition of pumice-stone while these limestones were forming. 5. The peroxide of manganese is probably a secondary product of the decomposition of the volcanic rocks and minerals in the areas where the nodules of manganese are found. 6. There are many minute particles of native iron in deposits far from land, some of which are little spherules; and these last, as well as some other spherules which are magnetic, probably have a cosmic origin. 7. The peroxide of manganese deposits in the deep sea are different in structure and composition from known ores of manganese. 8. The geological series has no equivalents of the rocks now forming in the deep sea far from land. H. A. N.

Tietze, Dr. E. Zur Theorie des Salzsteppen und der angeblichen Entstehung der Salzlager aus Salzsteppen. [Theory of Salt Steppes, &c.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. Heft 4, pp. 341–374.

Controverts Pošepny's view that the salt of inland steppes deposited in basins without an outflow has been derived from the sea, carried by winds, and precipitated with rain. Shows that the Persian and other salt-lakes derive their salt from Tertiary salt-beds, &c. Examines the case of Wieliczka and others, showing that fossils are against the salt-steppe and wind-borne theory, while the phenomena of the Kara Bugas Gulf are a modern parallel to what must have taken place during the formation of salt-beds. E. B. T.

Waters, A. W. On the frequent Alteration of Calcareous Fossiliferous Sands to Unfossiliferous Beds by the Infiltration of Water. *Trans. Manch. Geol. Soc.* vol. xiv. pp. 187–189.

Alludes to the observations of Vanden Broeck, on acid water dissolving out calcareous matter, and staining Belgian Tertiary sands.

Young, Prof. John. Address. *Proc. Nat. Hist. Soc. Glasgow,* vol. iii. pt. ii. pp. 123–125.

Refers to recent deep-sea deposits as bearing on the origin of rocks.

SUPPLEMENT FOR 1874 and 1876.

Andræ, —. Ueber den Ursprung der Steinkohle. [Origin of Coal.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4. Bd. i. *Sitzungsb.* pp. 65, 66. [1874.]

Darwin, Dr. C. Ueber den Bau und die Verbreitung der Corallen-Riffe. Translated by **J. V. Carus.** 3 maps. 8vo. *Stuttgart.* [1876.] Price 8 marks.

See notice of English Ed. in the Geological Record for 1874, p. 354.

Galton, John G. 'In the Wake of the Challenger.' *Pop. Sci. Rev.* vol. xv. pp. 1–30. [1876.]

Notes the geological bearings of the discovery of the Red Clay.

Griffith, C. The Voyage of H.M.S. Challenger. *Journ. Winchester Sci. Soc.* vol. ii. pp. 132–152. [1876.]

In the same ocean 5 kinds of sedimentary rocks are now forming, their mineral character and the presence or absence of organic remains depending upon definite conditions of latitude and depth. T. V. H.

Hoernes, Dr. R. Zur Bildung des Dolomites. [Formation of Dolomite.] *Verh. k.-k. geol. Reichs.* pp. 76–80. [1876.]

APPLIED AND ECONOMIC GEOLOGY.

Sub-Editor W. Topley, F.G.S., Assoc. Inst. C.E.

Anon. A Treatise on the Science and Practice of the Manufacture and Distribution of Coal-gas. 4to *London.*

No. 3 (Chap. ii.) contains the following articles:—Geology of Coal, pp. 70–72; Origin and Formation of Coal, 72–76; the arious kinds of Coal, 75–78; the Chemical Composition of Coal, 8–80; Analysis of Coal, 80–84; Gas-producing power of Coal, 85–96. W. T.

——. Chilian and Peruvian Mining and Metallurgy in 1712. *Metallurgical Review*, vol. i. pp. 525–548.

Gives an account of, and long extracts from, Frezier's "Voyage to the South Sea and along the coasts of Chili and Peru, in the years 1712, 1713, and 1714." Describes stream-gold, silver and mercury mines. W.T.

——. Katalog zur Ausstellung westfälischer Steinkohlen, Herbst. [Catalogue of an Exhibition of Westphalian Coals.]

Describes specimens of Coal from various pits; maps and diagrams of the Coal Field. (See *Iron*, Oct. 13, 1877, p. 453.)

——. Agenda Dunod, No. 2. Mines, géologie, métallurgie, exploitation, à l'usage des ingénieurs, garde-mines, maîtres mineurs, etc. [Dunod's Note-books, No. 2.] Pp. 180, 315, Paris.

Contains many geological tables, notes, &c.

Böck, Jean. Statistique internationale des mines et usines, publiée par le Comité central de Statistique de Russie. [Mining Statistics.] Part i. Pp. 207. 4to. *St. Petersburg.*

Gives statistics of mining, &c. in Great Britain, Ireland, Scandinavia, Germany, and Austria, from 1853 to 1872.

Brannon, P. A Visit to the Marble Quarries and Compact Limestone Workings of Anglesey. (Reprinted from the *North Wales Chronicle.*) 8vo. *Bangor.* Pp. 17; plan of Dinorben Quarries.

Burckhardt, F. Notie sur les Carrières de Saillon (Suisse). [Quarries at Saillon, Switzerland.] Pp. 9, autolithograph.

Describes 6 beds of marble, 3 of which are worked—Portor-Suisse, White statuary, Cipolin antique (2 beds—black green-veined, white green-spotted). The 3rd and 4th were the most highly prized in ancient Rome, and are not known elsewhere. W. H. D.

Champlin, J. D., Jun. Antique Marbles. *Pop. Sci. Monthly*, May, *West. Rev. Sci. Ind.* vol. i. pp. 137–144.

Describes the marbles used by the Greeks and Romans.

Couchman, T. Mineral Statistics of Victoria for the year 1876. No. 6, pp. 54. Fol. *Melbourne.*

——. Report of the Chief Inspector of Mines for the year 1876 No. 1. pp. 40. Fol. *Melbourne.*

Deby, Julien. Report on the Progress of the Iron and Steel Industries in Foreign Countries. *Journ. Iron Steel Inst.* pp. 213–302, pt. i. and pp. 1–243, pt. ii.

Refers to Minas Geraes and to the new iron-district in S. Ohio. Gives analyses of coal, &c.

Ekenstam, —. Ueber Schwedens Steinkohlenbergbau, 1876. [The Production of Coal in Sweden in 1876.] *Berg. hütt. Zeitung*, vol. xxxvi. p. 175. Abstract in *Proc. Inst. Civ. Eng.* vol. l. pp. 281, 282.

Evershed, —. A proposed source for the Water Supply of London. *R. Sch. Mines Mag.* vol. ii. pp. 24–29.

Suggests the interception of the large chalk-springs in and near the Thames, &c.

French, J. C. Mica and its Uses. *Journ. Appl. Sci.*

Garnier, J. [Treatment of Oxidized Ores of Nickel.] *Mém. Soc. Ing. Civ.* pp. 441–450. Abstract in *Proc. Inst. Civ. Eng.* vol. li. pp. 335–337, and vol. lii. pp. 342, 344.

The ores of New Caledonia occur in layers, strings, and nodules in serpentine. Analyses are given. The ores are hydrated silicates of nickel and magnesium. W. T.

Harden, J. H. Chart showing the production of Anthracite Coal in the Lehigh, Schuylkill, and Wyoming Regions; Anthracite, Bituminous, and Charcoal Pig Iron in the United States, and Petroleum in Pennsylvania, from 1820 to 1876. *Trans. Amer. Inst. Min. Eng.* vol. v. pp. 504, 505, pl. x.

Henderson, Richard. Manual of Agriculture; including the Application thereto of . . . . Geology . . . .

Hewitt, A. S. A Century of Mining and Metallurgy in the United States. *Trans. Amer. Inst. Min. Eng.* vol. v. pp. 164–196.

President's address. The appendix consists of tables of the production of leading metals and minerals in the United States during a series of years. R. B. N.

Homersham, S. C. Report on Water Supply (of Wimbledon). 8vo, pp. 46.

Describes water from the Chalk, reprinting extracts from various reports of earlier date. Analyses by **Dugald Campbell.**

Hunt, R. Mineral Statistics of the United Kingdom of Great Britain and Ireland for the year 1876. 8vo. *London.* Pp. xv. Price 2*s.*

Jefferson, J. C. Clausthal Mining School Notes. A series of Lectures. *Min. Journ.* vol. xlvii.

Lectures i.–v. pp. 82, 102, 138, 167, 194; the mode of occurrence of the useful minerals or mineral deposits.

Lectures xiv.–xvii., pp. 222, 250, 278, 302; the systems of prospecting for minerals, boring, &c.

Lectures xxv.–xxxvi., pp. 527, 555, 583, 611, 638, 666, 694, 722, 751, 778, 806, 834; Boring operations.

Lectures xxxvii.–xxxix., pp. 862, 890, 918; the methods in which mines are opened out and worked. R. M.

Joffroy, —. Les terrains argilo-calcaires et le Phylloxera. [Argillo-calcareous Soils and *Phylloxera.*] *Compt. Rend.* t. lxxxv. pp. 25–27.

Superficial geology applied to viticulture, from observations in Vaucluse.

Johnson, W. H. On the resources and future development of the Coalfields of Europe. *Trans. Manch. Geol. Soc.* vol. xiv. pp. 347–356.

Gives details of yield in 1876 of several German coalfields.

Johnston, Prof., and **Prof. Cameron.** Elements of Agricultural Chemistry and Geology. Ed. 10. 8vo. *London.*

Kedzie, Prof. W. K. The Elements of Agricultural Geology Pp. 96. *Cincinnati* and *New York.*

Kerpely, Antal. Magyarorszag Vasköver és Vasterményei különös tekintettel a vas legföbb chemiai és physikai tulajdonsagaira. [Hungarian Ironstone and Iron Trade.] Pp. 88; 4 tables, 2 pls. 4to. *Budapest.*

Lewis, J. F. The Hematite Ore Mines and Blast Furnaces East of the Hudson River. *Trans. Amer. Inst. Min. Eng.* vol. v. pp. 216–235.

Enumerates 38 mines, 24 of which are in work; their yield in tons per year is given. Gives analyses of the ores, which show from 35 to 53 per cent. of metallic iron. R. B. N.

Lintern, W. Mineral Surveyor and Valuer's Complete Guide. .... Pp. viii. 179. 12mo. *London.* Price 4*s.*

Notes on Minerals, Valuation of Mines, &c., on pp. 67–78.

Lucas, Joseph. The Chalk Water System. *Proc. Inst. Civ. Eng.* vol. xlvii. pp. 70–112 (Discussion, pp. 113–167; 2 woodcuts); pls. 3, 4, 4*a*. (Geological Map, scale an inch to a mile; Sections.)

Principally a description of the Chalk area of E. Surrey and W. Kent, or between the rivers Wey and Darent; but also refers to Sussex (Chilgrove) and Herts. Gives details of the level of water in many wells; from these, and from springs, works out a system of water-contour, drawn (for minimum epochs) on the map at intervals of 50 feet. A comparison of the rainfall, and the variation of these water-contours, proves the limited capabilities of the Chalk water-system; the great fluctuations of the water-line representing only a film of rain. W. T.

Lucas, Joseph. Hydrogeology: one of the Developments of Modern Practical Geology. *Trans. Inst. Surveyors*, vol. ix. pt. vii. pp. 153–177, plate; Discussion, pp. 178–184; pt. viii. pp. 185–208 (with Section of Bonwell Spring, by **John Bravender**); pt. ix. pp. 209–232 (with Section through the Chiltern Ridge to the Sea, by **S. C. Homersham**, and Table of Guagings at Croydon, by **B. Latham**).

Refers especially to the Springs and Wells of the U. Greensand between Farnham and Otford. The water-system of the U. Greensand along this line is quite distinct from that of the Chalk. Of 54 springs, 31 have determined the sites of settlements (24 farmhouses, 7 villages), 20 remain in their natural state, 6 are in parks, 3 supply mill-ponds. A list of springs and wells is given, stating the height, depth of well, depth to water, &c. Refers to dew-ponds, percolation, &c. W. T.

——. Hydrogeological Survey. Part I. Explanation accompanying Sheet I. Pp. 8. 4to. *London.* Price 6*d.*

Explanation of the map of parts of Middlesex, Surrey, and Kent (see *post*, MAPS).

Marzocchi, G. [Bridge over the Torrent Fegana, in the Province of Lucca, Italy.] *Giornale del Genio civile*, vol. xvi. pp. 33–81. Abstract in *Proc. Inst. Civ. Eng.* vol. liii. pp. 310, 311.

Describes sandstone, &c. used in building.

Meade, Richard. Notices of the iron industries of Cornwall. *Mining Journal*, vol. xlvii. p. 239.

Iron Industries of Devonshire, p. 711, Coal and Iron Industries of North Wales, pp. 900, 956, and Scotland p. 1004. Gives an account of the mode of occurrence of the ores of iron, of the production since 1855, and of the distribution and analyses of the ores. R. M.

Menche de Loisne, —. [Water Supply to Manufacturing Towns in the District of Lille.] *Annales des Ponts et Chaussées*, ser. 5, vol. xv. p. 571; 2 pls. Abstract in *Proc. Inst. Civ. Eng.* vol. liii. pp. 321, 322.

Water is got from a well sunk through Tertiary beds to the Chalk.

Morgan, Alfred. On some of the Infusorial Earths, and the uses to which they are applied. *Proc. Liverpool Geol. Soc.* vol. iii. pp. 272–281.

Some dynamites require 25 p. c. of infusorial earth, which acts as a inert carrier of the explosive oil mixed with it. Agriculturists in the United States use the "Nevada earths," as "Electro-Silicon;" and they are valuable, from their low conducting powers, for covering powder magazines, fireproof safes, &c. C. E. R.

Piquet, A. [The Mineral Wealth of the Province of Santander.] *Mém. Soc. Ing. Civ.* p. 259. Geol. Map. Abstract in *Proc. Inst. Civ. Eng.* vol. lii. pp. 341, 342. [Title only above, p. 88.]

The rocks richest in ores are the Cretaceous; next follow the Carboniferous, Triassic, and Jurassic. The calamine-deposits of the

Cretaceous rocks most occur near dolomite; they are irregular in form, but generally follow the bedding. Teeth of elephant and rhinoceros occur, impregnated with calamine. In the Carboniferous rocks the calamine occurs in veins. W. T.

Ponzi, G. Sulla Tuscia Romana e la Tolfa. *Atti R. Ac. Linc.* ser. 3, *Trans.* vol. i. pp. 210, 211.

Part 4 (conclusion) of a memoir on the mineral produce of the country. Deals with limonite, galena, &c.

Pütz, Carl. Ursachen und Tragweite der Krise in der Kohlen- und Roheisen-Industrie Deutschlands. *Giessen.* See *Iron*, Oct. 13, p. 453.

Statistics of coal and iron produce in various countries.

Raymond, R. W. Statistics of Mines and Mining in the States and Territories West of the Rocky Mountains. Eighth Annual Report. Pp. x, 519. 8vo. *Washington.*

Part 1. Condition of the Mining Industry. Among the plates are a Map of the Extinct River System of the California Auriferous Belt; a Geological Map of the S.W. portion of Plumas County, by **J. E. Edman**; Mines on South Mountain, Colorado (plan). W. W.

Reid, Henry. The Science and Art of the Manufacture of Portland Cement...... Pp. xix, 428. 8vo. *London* and *New York.*

Analysis of Aberthaw limestone, by **Phillips**, p. 7. Geological and Mineralogical Observations, pp. 31–119, with analyses of various limestones, clays, granites, greenstones, basalts, &c., from various places. W. W.

Richards, W. A Practical Treatise on the Manufacture and Distribution of Coal-Gas. Pp. 360. 4to. *London.*

Several descriptions of coal, with analyses, on pp. 53–68.

Richardson, Ralph. On the Connection between Agriculture and Geology. *Coll. Guard.* vol. xxxiii. p. 722. (*Mid-Lothian Agricultural Club.*)

States the necessity of farmers having a knowledge of superficial geology in order to estimate the value of their soils. Suggests the importance of maps to illustrate superficial geology. R. B. N.

Rothwell, R. P. The Coal Production of the United States. *Trans. Amer. Inst. Min. Eng.* vol. v. pp. 375–380.

Gives two tables of Coal Production of the United States, and of Anthracite Coal Production of Pennsylvania, in tons.

Rewley, Walter. Deep Mining and Recent Achievements of Engineering in Connection therewith. *Proc. Geol. Soc. W. R. Yorksh.* n. ser. pt. iii. 163–178.

Under the heads: 1. Early Records and Growth of Deep Mining; 2. Deep Mines (16 noticed, and also 13 in Gt. Britain); 3. Deep Boreholes (8 noticed). 4-7, Machinery, &c.; 8 Probable Future of Deep Mining. W. W.

Siemens, Dr. C. W. President's Inaugural Address. *Journ. Iron Steel Inst.* pp. 6–34; and *Nature*, vol. xv. pp. 462, 463. (See also note on p. 489.)

Gives tables of the Coal Areas and Annual Coal Production of the Globe.

Signorile, G. [Limes and Cements of Casale, Piedmont, and Liguria.] *Giornale del Genio civile*, vol. xv. pp. 301–317. Abstract in *Proc. Inst. Civ. Eng.* vol. li. pp. 284, 285.

Smith, C. D. Ancient Mica Mines in North Carolina. *Ann. Rep. Smithson. Inst.* for 1876, pp. 441–443.

Describes old workings on mica-veins near Franklin, done with stone implements.

Steavenson, A. L. On the Coke Manufacture of South Durham in relation to the Iron and Steel Trades of the North of England. *Journ. Iron Steel Inst.* pp. 403–412.

The South Durham Coking Coal-field has a length averaging 23 miles, width 11 miles, area 253 sq. miles; it extends from Bradbury Station on the south to Gateshead on the north. R. B. N.

Stella, —. Prodotti minerali inglese nel 1875. [English Mineral Products for 1875.] *Boll. Cons.* vol. xii.

Stubben, J. [The Waterworks of Aix-la-Chapelle.] *Deutsche Bauzeitung*, vol. x. pp. 194, 195. Abstract in *Proc. Inst. Civ. Eng.* vol. xli. p. 381.

Water got by a horizontal gallery in the Chalk.

Taunton, J. H. Description of the Malmesbury Water Works, with remarks on the Flow of Streams in the Cotteswold District. *Proc. Cotteswold Club*, vol. vi. pp. 301-306.

Springs of an Artesian character were tapped "in or under the Forest Marble," at a depth of about 30 feet, as shown in section. Analyses by **Dr. A. Voelcker** and **C. Heisch.** H. B. W.

Tecklenburg, —. Vergleichende Zusammenstellung der Production der Bergwerke in den Jahren 1860 bis 1876. *Notizbl. Ver. Erdk. Darmstadt*, F. 3, Heft 16, pp. 163–164.

Gives a table of the returns of iron, manganese, copper, lead, &c.

Thalén, R. Sur la recherche des mines de fer à l'aide de mesures magnétiques. [Discovery of Iron-ores by Magnetic Observations.] *Nova Acta R. Soc. Upsal.* 4th centenary volume. 4to. See Geological Record for 1875, pp. 198, 413.

Whitehead, Charles. Fruit-growing in Kent. *Journ. R. Agric. Soc.* ser. 2, vol. xiii. pp. 92–121.

Refers to the geology of the fruit-bearing districts in East, Mid, and West Kent.

Berichte über.......... Commission für Wasserversorgung, &c. [Second Report on Water-supply, &c. of Munich.] *Munich.* Pp. 212; 15 pls. Abstract in *Proc. Inst. Civ. Eng.* vol. li. pp. 382–384.

Munich is supplied by town-wells, which, with one exception, are very impure. It is proposed to take springs in the Mangfall Valley. Analyses of all these waters are given. **Dr. Gümbel** (in Supplement No. 3) describes the geology of Munich, and its relation to subsoil water-currents, giving diagrams showing the contour of the subsoil-water for each month in 1876, as observed at 500 points. W. T.

Reports of the Inspectors of Mines........for the Year 1876. Fol. *London.* Pp. xxiv, 405; plans. Price 6*s.* 6*d.*

Gives the yield of various mines, with occasional notes on the lodes or seams of the mines in which accidents have happened.

Die Bergwerksindustrie und Bergverwaltung Preussens im Jahre 1876. [Mining Industry of Prussia in 1876.] *Zeitsch. Berg-, Hütt. Salinenw.* Bd. xxv. *Abhandl.* pp. 333–359.

[Mineral Statistics of the Prussian States for 1876.] *Zeitsch. Berg-, Hütt. Salinenw.* Bd. xxv. *Statist. Theil.* Pp. iv, 229, 94.

See also the following :—

Anderson, A. D. The Silver Country. Mineral Wealth of Mexico, &c.: p. 118.

Araus, F. G. Mines, Madrid District: p. 104.

Ball, V. Economic Resources of the Rajmahal Hills: p. 138.

——. Diamonds, lead, &c., Sambalpúr: p. 139.

Cortazar,—. Agriculture, Valladolid: p. 58.

Curioni, G. Applied Geology, &c., Lombardy: p. 59.

De Rance, C. E. Agricultural Geology, Lancashire; and Underground Waters, N. R. S.: p. 10.

Engelmann, —. Lignite, California: p. 135.

Gombau, I. Mines, Tarragona: p. 66.

Grand, A. Asturias Coalfield: p. 109.

Herrera, A. Mines, Jaen: p. 73.

Heurteau, E. Mineral Riches of New Caledonia: p. 169.

Hughes, T. W. H. Wardha Valley Coal-field: p. 141.

Munroe, H. S. Mineral Wealth of Japan: p. 166.

Mallet, F. R. Indian Coal and Limestones: p. 143.

Oriol y Vidal, R. Palencia Coalfield: p. 111.

Ulrich, G. H. F. Tasmanian Minerals: p. 161.

Wimmer, —. Rammelsberg Ores: p. 103.

Wolff, G. Australian Gold: p. 162.

Wyley, A. Iron-ores, Austria: p. 103.

SUPPLEMENT FOR 1874–76.

Anon. (? **H. Sandham.**) Catalogue of the Collection illustrating Construction and Building Materials in the South Kensington Museum. New Edition. Pp. xvi, 255. 8vo. *London.* [1876.]

Building Stones, pp. 1–11; Artificial Stone, p. 12; Marbles and Imitation Marbles, 13–20; Slate, 21–25; Cements, Plasters, &c., 26–33. The qualities of the stones, &c. are described, and notes given on their mode of occurrence, geological position, &c. W. T.

——. Mining in Canada in 1875. *The Globe* (*Toronto*), April 18, 19, 21. [1876.]

Statistics of work and produce of gold, silver, copper, lead, iron, coal, albertite, peat, petroleum, phosphates, slate, mineral paints, gypsum, hydraulic cement, and plumbago. W. H. D.

Coignet, —. Notes sur la richesse minérale du Japon. [Mineral Wealth of Japan.] *Bull. Soc. Min. St. Etienne*, sér. 2, t. iii. p. 473. [1874.]

De la Beche, Sir H. T., T. Reeks, and **F. W. Rudler.** Catalogue of Specimens in the Museum of Practical Geology, illustrative of the Composition and Manufacture of British Pottery and Porcelain, from the Occupation by the Romans to the Present Time. Ed. 3. Pp. xvi, 336. 8vo. *London.* Price 2*s.* 6*d.*

Composition and Origin of Clays, pp. 3–6; Raw Materials (with analyses of clays), pp. 16–20; Analysis of St. Yriex pegmatite, p. 51; Section at Cannon St., London, p. 63; Catalogue of specimens illustrating the Clays and Plastic Strata of Great Britain, by **G. Maw**, pp. 273–309. W. W.

Gruner, E., Junr. Mémoire sur la situation de la métallurgie du fer en Styrie et en Carinthie. [Situation of the Iron-Industry of Styria and Carinthia.] *Ann. Mines,* sér. 7, t. ix. pp. 471–518. [1876.]

Gurlt, —. Ueber ein neues Steinsalzvorkommen bei Hänigsen in Hannover. [Rock-salt, Hanover.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. ii. *Sitzungsb.* p. 76. [1875.] See GEOLOGICAL RECORD for 1876, pp. 88.

Helmhacker, R. Ueber den Kies-Bergbau zu Luckavic in Böhmen. [Pyrites-Mine in Bohemia.] *Zeitsch. berg- hütt. Ver. Kärnthen.* [1876.]

Messikommer, J. Das fossile Brennmaterial und der Torfbau in der Ostschweiz. [Fossil Fuel and Peat in E. Switzerland.] *Neue Alpenpost,* Bd. iii. no. 11, p. 132. [1876.]

Newton, H. The Ores of Iron.......... *Coll. Guard.* vol. xxxi. pp. 620–622, 660–662, 700–702. [1876.]

Reprint of paper noticed in the GEOLOGICAL RECORD for 1875, p. 378.

Phillips, J. S. The Explorers', Miners', and Metallurgists' Companion...... Ed. 2. Pp. 671. 8vo. *San Francisco* and *London.* [1875.]

Section i. Geology and Mineralogy, pp. 17–98. Section ii. Exploration. Section iii. Assaying and Discrimination. Section iv. Mining and Engineering. Section v. Metallurgy. W. W.

Pischke, von. Mittheilungen über die Silber- und Goldgewinnung im Bergwerksdistrikte von Nertschinsk. [Gold and Silver, E. Siberia.] *N. Jahrb.* pp. 897–906. [1876.]

Rey-Lescure, —. Carte agro-géologique du Tarn-et-Garonne. *Bull. Soc. Hist. Nat. Toulouse,* t. viii. p. 201. [1874.]

——. Esquisse agro-géologique du Tarn-et-Garonne. *Ibid.* p. 209. [1874.]

[*Note.*—Many papers, &c. that refer to the practical application of geology, and to the occurrence of coal, metalliferous ores, &c., are noticed under STRATIGRAPHICAL GEOLOGY.

The GENERAL INDEX gives references to all minerals of economic value.]

PETROLOGY.

Sub-Editor Prof. T. G. Bonney, F.R.S., F.G.S.

Allport, S. On certain Ancient Devitrified Pitchstones and Perlites from the Lower Silurian District of Shropshire. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 449–460, pl. xx. (rock-sections).

Describes vitreous and compact felsitic rocks, giving anaylses. The structure of the compact varieties shows them to have been originally vitreous; and gradations occur between the two. W. H. D.

Anon. Analyses of Various [Silurian] Limestones. *Proc. Dudley Geol. Soc.* vol. 3, no. 5, p. 114.

Aymestry Limestone from Sedgley, Wenlock Limestone from Dudley (2), Walsall, and Lindley, Barr Limestone from Hay Head.

Bacon, J. A Pound of Kilburne Coal; what it consists of, and what can be got out of it. *Coll. Guard.* vol. xxxiii. p. 616.

Contains an analysis of "Kilburne best" coal.

Becke, Friederich. Gabbro von Langenlois. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. p. 278.

Analysis of a gabbro from Langenlois in Lower Austria. It contains silica 48·99, alumina 16·92, lime 16·69, magnesia 10·76, ferrous oxide 5·56 p. c. F. W. R.

Blake, Prof. W. P. On Itacolumite. *Proc. Ac. Nat. Sci. Philadel.* for 1876, pp. 325, 326.

Describes specimens from California.

Bland, T. F. The Colour of the Sandstones and Marls. *Proc. Dudley Geol. Soc.* vol. 3, no. 4, p. 73.

Chemical tests show that peroxide of iron is the colouring matter of the Trias and Permian rocks of Stourbridge, Droitwich, &c., and of the Old Red Sandstone of Brecknockshire. W. H. D.

Bonney, Rev. T. G. On the Serpentine and associated rocks of the Lizard District. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 884–924.

The rocks of the district consist of hornblende-schist and altered sedimentary rock, serpentine, gabbro, diorite and altered basalts, and granite. The stratigraphical relations and microscopic structure of each are described. The serpentine is shown to be intrusive and an altered olivine rock containing enstatite (bronzite), augitic minerals, and picotite. There is gabbro of two ages, one rich in olivine. An appendix by **Mr. Hudleston** gives analyses of some of the rocks. T. G. B.

Bonney, Rev. T. G. The Lherzolite of the Ariége. *Geol. Mag.* dec. ii. vol. iv. pp. 59–64.

Describes the occurrence of this rock, especially near the Étang de Lherz, which appears to be intrusive to crystalline limestone. Consists of olivine, enstatite, diopside, and picotite. The microscopic structure of the rock is described, and the development of serpentine in certain parts of it. T. G. B.

——. On certain rock structures, as illustrated by Pitchstones and Felsites in Arran. *Geol. Mag.* dec. ii. vol. iv. pp. 499–511.

Considers relation of fissile structure described by him (Geological Record, 1876, p. 201) and banded structure, and shows that they are of independent origin. Describes instances of banded, perlitic, and spherulitic structure, and shows that in certain cases a contractile force, during crystallization, may have had an important influence in producing the last. The relation of a spherulitic rock on the Corriegills shore to some associated rocks is also discussed. T. G. B.

——. Microscopic structure of Luxullianite. *Min. Mag.* vol. i. no. vii. pp. 215–221, plate.

Describes the microscopic structure of this Cornish rock, and gives reasons for considering it an altered granite—the magnesia mica being replaced by a brown tourmaline, and nests of acicular tourmaline of different colour being apparently formed from the felspar, while quartz is formed from the excess of silica. Notices some other tourmaline rocks. T. G. B.

Bořický, Dr. E. Elemente einer neuen chemisch-mikroskopischen Mineral- und Gesteinsanalyse. [New chemico-microscopic Method of Rock-analysis.] *Arch. Nat. Land. Böhm. Arb. geol. Abth.* Bd. iii. Abth. 5, pp. 1–80, pls. 1, 2.

1. Consists in the action of silicofluohydric acid; a drop of 3 p. c. solution is placed on the thin slice in balsam, and allowed to dry; the bases dissolved out are recognized by the form of the crystals. 2. Those minerals not attacked by the preceding are treated with fluohydric acid vapour on the same principles; this is also found effective for making very opaque slices transparent. 3. On the results of chlorine used in the same way. Succeeding chapters treat of recognizing minerals by etched figures produced by the above reagents, &c.; analytical tables for this method, &c. E. B. T.

Branco, D. W. I vulcani degli Ernici nella Valle del Sacco. [Volcano in the Sacco Valley.] *Atti R. Ac. Linc.* ser. 3, *Mem.* vol. i. p. 801. Abstract, *ibid.*, *Trans.* p. 180.

Describes leucitopyroxenic lava, and enumerates contained minerals.

Britton, J. B. Water in Coals. *Trans. Amer. Inst. Min. Eng.* vol. v. pp. 97–99.

Anthracite, bituminous coals, and lignites contain water either in the combined or uncombined state; and when subjected to high temperatures water and hydrocarbons are given off, decreasing the weight of the coals. R. B. N.

Brögger, W. C. Om Veskaffenheden af gruset ved Hougesæter på den romerikske slette. [Deposits of Gravel at Hougesæter, on the Romerik plain, Norway.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 234–241, plate (rock-sections).

Account of the petrography of the rocks in the gravel.

Brun, J. Sand aus der Sahara. [Sand from the Sahara.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft ii. pp. 221, 222.

Examination of sand from 5 localities. Consists principally of white transparent grains of quartz, with granules of gypsum, carbonates of lime and magnesia, and peroxide of iron. Some of the gypsum seems to have been dehydrated by the transparent grains of quartz having acted as burning-glasses, and heated the sulphate until it became anhydrous. The ferric oxide is derived from alteration of pyrites. Chemical and mineralogical analyses of the sand are given. Insoluble silica =70·57 p. c. F. W. R.

Church, Prof. A. H. Analysis of a Serpentine from Japan. *Min. Mag.* vol. i. no. iv. pp. 99, 100.

The specimen was worked and sold under the name of jade. The analysis shows it to be a true serpentine.

Collins, J. H. On the Serpentine of Duforth, in St. Austell Bay, Cornwall. *Min. Mag.* vol. i. no. vii. pp. 222–224, plate.

Describes the mode of occurrence of the rock, which is intrusive, and varies considerably in mineral character, being in one place almost free from magnesia, in another containing 30 p. c. T. G. B.

Cossa, Prof. Alfonso. Sulla natura delle rocce che racchiudono i depositi di pirrotina nichelifera di Campello-Monti Varallo. [The Rocks containing Nickeliferous Pyrrhotine, &c.] *Atti R. Ac. Linc.* ser. 3, vol. i. *Trans.* pp. 169, 170.

Describes 4 species of rock.

——. Sulla composizione della Sienite del Biellese. [Composition of Biellese Syenite.] *Atti R. Ac. Turin,* vol. xii. pp. 409–411.

Reply to Prof. Kenngott. (See also GEOLOGICAL RECORD for 1876, p. 203.)

Cossham, H. Coal and its Uses. *Coll. Guard.* vol. xxxiv. pp. 960, 961, 990–992.

Describes the formation of coal; alludes to the presence of tar and oil in coal.

Credner, Prof. H. Der rothe Gneiss des sächsischen Erzgebirges, seine Verbandverhältnisse und genetische Beziehungen zu der archäischen Schichtenreihe. [Saxon Red Gneiss, &c.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. Heft 4, pp. 757–792, pl. ii.

Examines the views of those who have held the red gneiss to be eruptive in contradistinction to the grey, which latter is admitted by all to belong to the Archæan schists. Shows that, in all cases where red gneiss is supposed to be disruptive or intrusive, such rock was falsely called gneiss; that there is no single case of the red gneiss being connected with any granitic rock, that it forms beds or lenticular masses in the grey or Muscovite gneiss and the mica-schists of the Erzgebirg and Saxon Mittelgebirg. It is characterized by containing biotite; but a gneiss intermediate between it and the grey contains both micas. These are all in conformable series, and form one group with the Archæan schists. The gneiss is therefore of sedimentary origin. E. B. T.

Dathe, E. Die Diallag-Granulite der sächsischen Granulitformation. [Diallage-granulite of Saxony Granulite-district.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. Heft 2, pp. 274–340, tab. 4.

The normal granulite of Saxony has associated with it in alternating layers, in places, diallage-granulite, hornblendic schist, diallage-olivine rock, streaky gabbros, &c. The dark or black rock, "diallage-granulite" as the so-called trap-granulite is here named, is specially described. It occurs in thin layers, up to a metre or so, alternating with granulite; it varies in composition, containing from 73 p. c. silica when rich in orthoclase, down to 46 p. c. when devoid of it. Microscopically, the diallage, plagioclase, &c. constituents are generally grouped in lamellar fashion. Reasons are given against the granulite formation of Saxony being eruptive; in its alternating condition, microscopic structure, &c. it agrees with the gneiss series of the Bavarian frontier. E. B. T.

Doelter, Dr. C. Ueber die Eruptivgebilde von Fleims, nebst einigen Bemerkungen über den Bau älterer Vulcane. [Eruptive Rocks of Val Fassa.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Bd. lxxiv. pp. 857–878, geol. map.

Notes on the rocks which successively break through the Trias round Predazzo, mentioning petrographic varieties, the position of eruptive centres, directions of dykes or mode of occurrence. The masses of monzonite are held to be of the nature of great dykes, one mass at Predazzo being about 600 metres broad. E. B. T.

Ferrero, —. Studî sopra le rocce vulcaniche. [Volcanic Rocks.] *Ann. Staz. Agr. Caserta*, ann. v.

——. Analisi di Marne. [Analyses of Marl.] *Ibid.*

Francis, E. On a Chemical Examination of Specimens from the recently discovered Coal Deposits at Williamsville and Montserrat. *Proc. Sci. Assoc. Trinidad*, no. xi. pp. 125–134.

Analyses and other details of the coals mentioned in Mr. Guppy's paper. Analyses of British coals are quoted for comparison.

Frankland, Dr. Series of six lectures delivered in the Royal School of Mines. *Min. Journ.* vol. xlvii.

Lectures II. & VI., on the chemistry of coal, pp. 2, 30, 58.

Frazer, Persifor, jr. A Study of the Igneous Rocks. *Trans. Amer. Inst. Min. Eng.* vol. v. pp. 144–146.

Remarks on the preparation of rock-sections for the microscope.

Frisch, Hugo. Quartztrachyt von Gleichenberg. [Quartz-trachyte of Gleichenberg.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. pp. 276, 277.

Analysis of a sanidine-trachyte from Gleichenberg, in Styria.

Gamroth, Alois. Paläopikrit von Otteuschlag. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. p. 278.

Analysis of a rock occurring in large blocks at Ottenschlag, in Lower Austria. It is referred to the species Palæopicrite.

Guignet, E. Sur divers échantillons d'argile et de houille du Brésil. [Brazilian Clays and Coals.] *Compt. Rend.* t. lxxxiv. pp. 1326–1328.

Describes the following specimens:—Bituminous schist from Bahia, of very recent date; white clay (kaolin?) from Caçapava, in the Province of S. Paulo, locally known as *tabatinga*, and used for whitewashing; lignite (inferior) from same locality; very good coal from Tiété (same Province). G. A. L.

Hall, C. E. The Conversion of Peat into Fuel and Charcoal. *Trans. Soc. Eng.* for 1876, pp. 151–165; Discussion, pp. 165–186.

Tables of Composition of Peats, pp. 170–172.

Harcourt, Prof. A. V. The Chemistry of Gas Manufacture. Lecture 1. *Journ. Soc. Arts.* vol. xxv. no. 1285, p. 795.

Refers to the formation of coal.

Harrington, B. J. Notes on a Few Dykes cutting Laurentian Rocks, more especially with reference to their Microscopic Structure. *Canad. Nat.* n. ser. vol. viii. no. 6, pp. 315–324, plate iii.

Figures and descriptions are given of the following rock-sections:—1. Diabase from Grenville, showing augite, plagioclase, magnetite, and viridite. 2. Dolerite (felspar-basalt) from River St. Simon, showing augite, plagioclase, magnetite, and a little viridite. 3. Dolerite from River Gagnon, showing augite, plagioclase, and magnetite. 4. Diorite from Madoc, Ontario, showing bluish-green hornblende, plagioclase, magnetite, and pyrite. 5. Apatite in rock from Grenville. 6. Apatite crystals exhibiting cavities (liquid?). R. B. N.

Haughton, Rev. Prof. Samuel. On Elvanite or Whitestone, from Middleton Hill, Longnor Hall, Shrewsbury. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. 4, p. 226.

The specimen, from the Bellcek Pottery Works, consists of a mixture of quartz and albite. The analysis is given, from which is deduced the following composition:—quartz 15·6, albite 84·4. E. T. H.

Hawes, G. W. On grains of Metallic Iron in Dolerytes from New Hampshire. *Amer. Journ.* ser. 3, vol. xiii. pp. 33–35.

Figures a microscopic section of chrysolitic doleryte in which grains of metallic iron are shown by the action of sulphate of copper. The specks of copper are visible to the naked eye. W. H. D.

Helmhacker, R. Ueber Diabas von Almadén und Melaphyr von Hankock. [Diabase of Almaden and Melaphyr of Hancock.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft i. pp. 13–24.

Specimens from the mercury-mines of Almaden, in Spain, have been examined microscopically. The rock known as "porphyry" is found to be a diabase, containing labradorite and augite, with chlorite and ilmenite. The rock called by the miners "Frailesca" or "Franciscaner," in consequence of its colour often resembling that of the dress of the Franciscans (*frailes franciscos*), is a diabase-tuff schist (*Diabastuffschiefer* or *Schalsteinschiefer*). The melaphyres described are from the copper-bearing rocks of Hancock, S. of Keweenaw Point, Lake Superior. F. W. R.

——. Ueber einige Quarzporphyre und Diorite aus dem Silur von Böhmen. [Quartz-porphyries and Diorites from the Silurian of Bohemia.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft ii. pp. 179–204.

The eruptive rocks associated with the Silurian strata in the neighbourhood of Prague are as follows:—Granite, younger than L. Silurian; Quartz-porphyry, L. Silurian and younger; Diorite, L. Silurian or younger; Corsite, younger than *étage* $D d_5$; minette of age of this *étage*; diabase in *étage* $E e_1$ and in L. Silurian. Describes some of these, viz. quartz-porphyries from Vran, Radošovic, Letek, and Libšic, felsite from Jenerálka, diorites from Podhor, Cenkov, Vodolka, Dolan, Selc, Podhaba, Libšic, Prácov, and Bukovan. F. W. R.

Hiortdahl, T. Mineral-analyser. [Analyses of Rocks.] *Nyt Mag. Nat.* Bd. xxiii. pp. 226–228.

Analyses of Anorthite-olivine-rock and Saussurite-gabbro from localities in Norway.

Hofmann, K. [Bakony Basalts.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 185–193.

Note giving general results supplementary to the work of Böckh [see GEOLOGICAL RECORD for 1874, p. 50]. Microscopic slices from 15 volcanoes of the district were examined; they all belong to the Felspar-basalts. Pre-existing broken crystals of olivine and felspar occur. Magnetite occurs in the upper part of the larger basalt hills, and ilmenite in the lower. E. B. T.

Hughes, Prof. T. McK. On a Series of Specimens illustrating the Formation, Weathering, and Fracture of Flint; with Note by **Prof. Stuart.** *Proc. Camb. Phil. Soc.* vol. iii. pt. i. pp. 12, 13.

Faulted and re-cemented flints are cases of jointed chalk irregularly replaced by flint. A bruising stroke gives a cone of 110° apical angle, but a breaking stroke a cone which truncates a larger cone of 30° apical angle. W. H. D.

Hull, Prof. Edward. On the Nature and Origin of the Beds of Chert in the Upper Carboniferous Limestone. With Chemical Notes by **E. T. Hardman.** Abstract. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. 4, p. 245.

Bands of chert occur at intervals in the Carboniferous Limestone of Ireland: but the highest beds are especially rich, and sometimes entirely replaced by it. The silica is chiefly in a gelatinous state. The analyses show that a passage from siliceous limestone into pure chert might be traced. During the close of the Carboniferous period in Ireland there was a shallow sea exposed to the sun's rays; the waters appear to have been charged with a somewhat large amount of silica in solution, drained from the surrounding lands of highly siliceous materials. Chemical replacements then took place, carbonate of lime being replaced by silica—the process being analogous to that described by **Prof. Duncan** as having occurred in the W. Indies. E. T. H.

Jannettaz, E. A Guide to the Determination of Rocks, being an Introduction to Lithology. Translated from the French by **G. W. Plympton.** Pp. 165. 8vo. *New York.* [? Original noted in GEOLOGICAL RECORD for 1874, p. 206.]

Part i. Properties of Minerals composing Rocks. Part ii. Description of Rocks. Part iii. Leading Characteristics of Rocks and means of Determination. Part iv. Geological (translated from **Meunier**). Tables for Determining Rocks. W. H. D.

Kalkowsky, E. [Red Gneiss.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 837–840.

Note to justify the assertion that the red gneiss of Saxony was considered eruptive by the Freiberg geologists.

Kinahan, G. H. Quartzite (Quartz-schist), Quartz-rock (Greissen). *Trans. Manch. Geol. Soc.* vol. xiv. pp. 326–346, plate 36.

Classes the siliceous rocks of Ireland into:—A. Quartzyte, or metamorphosed siliceous rock (Cambrian-Silurian). B. Quartz rock or Greissen, intruded rock, associated with intrusive granite or as independent bosses. C. Quartz-reefs or veins deposited in fissures from solutions. C. E. R.

Kjerulf, Th. Om stratifikationens spor. [Traces of Stratification.] *Christiania Universitets Testskrift i anledning af Upsala Universitets Jubilæum i Sept.* 1877. Pp. 39; 27 woodcuts. 4to. *Christiania.*

Calls attention to the difference between foliation and stratification, giving examples of highly metamorphosed sedimentary rocks in which the original lines of stratification are clearly visible, and of ore-deposits which evidently do not occur as layers. Many of the woodcuts are from hand specimens of rocks. E. E.

Kreutz, Dr. Felix. Augit-Andesite des Smrekouz-Gebirges in Süd-Steiermark. [Augite-Andesites of the Smrekouz Mountains, S. Styria.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft ii. pp. 205–212.

Microscopic examination of five rocks from the Smrekouz range, between Styria and Carinthia; and discussion of the relation of andesites to basalts on the one hand and to trachytes on the other. F. W. R.

Lawrence, R., and **C. C. Hutchinson.** On the Composition of the Buxton Limestone...... *Journ. R. Geol. Soc. Ireland,* ser. 2, vol. iv. pt. 4, pp. 249–252.

The analyses given show that this limestone is very pure, and well adapted for the manufacture of bleaching powder.

Leeds, Prof. A. R. Lithology of the Adirondacks. *American Chemist,* March. Notice in *Amer. Journ.* Sept.

Describes various rocks, mostly from Keene, in Essex Co., as norite, 44 varieties, giving analyses of labradorite, doleryte, and pyroxenic norite. W. H. D.

Lemberg, J. Ueber Gesteinsumbildungen bei Predazzo und am Monzoni. [Contact-alterations, &c.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 457–514, woodcuts.

The contact-phenomena of limestone with the igneous rocks at Cauzacoli, Predazzo, and at several places at Mt. Monzoni, are elucidated by a series of analyses. Next follow experiments to illustrate the formation of magnesian silicates. By digesting powdered batrachite with $MgCl_2$, the bulk of the calcium was removed, the remnant having much the composition of serpentine. The same treatment of mellilite, melanite, okenite, gehlenite, &c. resulted similarly in the calcium being replaced by magnesium, while experiments showed that it is far more difficult to convert magnesium into calcium-silicates: an exception to this, however, in nature, is the conversion of hornblende and augite into epidote; the last seems not to decompose. Analyses of several dykes of leebeuerite-porphyry and augite-porphyry are given, to show the changes they have undergone. Obsidian was converted into a hydrous silicate by digestion with an alkaline carbonate; this is connected perhaps with the origin of pitchstone, the large percentage of water in the latter being incompatible with the ordinary explanation. E. B. T.

Liebisch, Th. Mineralogisch-petrographische Mittheilungen aus dem Berliner mineralogischen Museum. *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 710–734.

1. Describes massive rocks from the Egyptian desert, granite-porphyry, quartz, felsite-porphyry, &c. 3. Syenite-porphyry from Norway, containing both augite and hornblende, &c. 4. Silesian granite-porphyries; the selvedges of the dyke differ from the middle, and look like quartz-porphyry; the phenomena generally are like those of the Hartz and Vosges. 6. On serpentine in hornblende-gneiss in Silesia; the serpentine contains grains of unaltered olivine and hornblende crystals in radiating bundles. E. B. T.

Liversidge, Prof. A. On a remarkable example of Contorted Slate. *Journ. R. Soc. N. S. Wales* for 1876, vol. x. pp. 241–242; 2 pls.

Imperfect slate from Peelwood Copper Mine, Tuena, probably Devonian. "A remarkable example of true contortion, accompanied by slaty cleavage, but contortion on such an extremely small scale, that it in certain aspects appears to resemble the well-known cone-in-cone structure." R. E., Jun.

Ludwig, Rudolf. Der crystallinische Kalk von Auerbach an der Bergstrasse und seine Begleiter. [Crystalline Limestone of Auerbach.] *Notizbl. Ver. Erdk. Darmstadt*, F. 3. H. 16, pp. 65–67.

Maskelyne, Prof. N. S. Stonehenge; the Petrology of its stones. *Wiltsh. Arch. N. Hist. Mag.* xvii. pp. 147–160, plate. Full account printed in *Wiltshire County Mirror*, Aug. 29, 1876, and *Newbury Weekly News*, Sept. 1876.

The stones are of four kinds. Microscopic sections are given. 1. Sarsen stones, Tertiary sandstone. 2. Dark micaceous sandstone. 3. Those previously called syenite or greenstone, &c. are shown to be diabase; augite, plagioclase, chlorite, magnetite, and quartz grains are the constituents, while there is no ground-mass. 4. Four obeliscoid stones are described as formed from the breaking down and redistribution of pre-existing igneous rocks; the microscopic slice shows fluidal structure in the ground-mass: they are harder than quartz; in one the percentage of silica was 77·4; the felspar contained in them is much decomposed; chlorite sometimes occurs in distinct crystalline aggregations. The character of the rock is schistose. E. B. T.

Mehner, Hermann Bruno. Die Porphyre und Grünsteine des Lennegebietes in Westphalen. [Porphyry and Greenstone, Westphalia.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft ii. pp. 127–178.

A full description of the megascopic and microscopic characters of the porphyries and greenstones of the Lenne district, including certain schistose rocks (Schalstein), regarded as porphyry-tuffs. Fragments of slate, and a considerable quantity of finely disseminated slaty matter, occur in these schistose rocks. Some so-called hyperites and greenstones (Labrador-porphyries) in this district are shown to be diabase.
F. R.

Mell, P. H. Analyses of Marls, &c. .. *Third Annual Report of the Commissioner of Agriculture of the State of Georgia* for 1876.

Michel-Lévy, A. Structure et composition minéralogique de la variolite de la Durance. [Structure and Mineralogical Composition of the Durance Variolite.] *Compt. Rend.* t. lxxxiv. pp. 264–266.

Regards Variolite as a compact member of the Euphotide series, and its globules as not being petrosiliceous—views opposed to those of Zirkel.

Möhl, H. Die Eruptivgesteine Norwegens, mikroskopisch untersucht und beschrieben. [Eruptive Rocks of Norway.] *Nyt Mag. Nat.* Bd. xxiii. pp. i–xv and 1–189 ; 8 pls. (rock-sections, coloured).

Contains a description of the mineralogical composition, and the microscopic as well as the macroscopic constituents of a great many Norwegian rocks, viz. 24 Granites, 17 Oligoclase-, Orthoclase-, Zircon-, and Elæolite-Syenites, 4 Granulites, 6 Quartz-porphyries, 6 Orthoclas-porphyries, 1 Porphyrite, 7 Augite-porphyries, 30 Gabbros, 13 Olivine-rocks and Serpentines, 6 Labrador-rocks, 5 Eklogites, 6 Hornblendic rocks, and 34 Greenstones. E. E.

Musaio, —. Quadro d'analise delle rocce vulcaniche. [Analysis of Volcanic Rocks.] *Ann. Staz. Agr. Caserta,* anno v.

Nardo, G. D. Sopra un pietra di origine e di provenienza incerte. Aporemite di speciale caratteristica mineralogica. [Stone of unknown origin and locality. Aporemite.] *Atti R. Ist. Ven. Sci.* ser. 5, vol. iii. disp. 2.

Nordström, Th. Om en vid Rösbergs jernmalmsgrufva, Jernboås socken, Orebro län, förekommande vittrad bergart. [Highly weathered Rock at Rösberg Iron-mine, Orebro District, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 435–437.

Notes on eurite, which is weathered to a depth of 25 metres. The horizontal dimension of this white powder-like mass is not known, but it is held to be at least 60–80 metres. Analysis given. E. E.

Ortlieb, —. [Note of Analyses of Loam.] *Ann. Soc. Géol. Nord,* t. iv. p. 232.

Paterson, W. M. Scotch Tripolite. *Chem. News,* vol. xxxv. pp. 151, 152.

Microscopic examination of a substance supposed to be clay from Ciste Mavichead, one of the Grampians, showed it to consist almost entirely of Diatomaceæ. Analysis gave 95·66 p. c. of silica, with 3·08 of alumina, and 0·28 of lime. F. W. R.

Pejacsevich, Count J. N. Az Ugyneveczett Urvölgyi Madárfészkekröl. [The so-called Birds' Nests of Herrengrund.] *Természet. Füzet.* köt. i. pp. 175–177 (in German, pp. 203, 204), pl. xi.

Describes and figures accumulations of pisolitic concretions.

Penck, Albrecht. *Nordische Basalte* im Diluvium von Leipzig. [Northern Basalts in the Leipzig Drift.] *N. Jahrb.* Heft iii. pp. 243–250. [Title only above, p. 87.]

Where pebbles of basalt have been found in the Drift of N. Germany they have generally been referred to a southern origin; but the microscopic examination of some basalt pebbles from Leipzig proves their identity with certain Scandinavian basalts. F. W. R.

Pettersen, Karl. Ueber das Vorkommen des Olivinfels im nördlichen Norwegen. (Zweiter Beitrag.) [Occurrence of Olivine-rock in the N. of Norway.] *N. Jahrb.* Heft viii. pp. 784–790, plate. [Title only above, p. 87.]

Describes the occurrence of olivine-rock N. of Tromsdalstind. The rock, on fracture, shows yellowish-green olivine, with much enstatite; it also contains anthophyllite, talc, chlorite, and a mineral which appears to be chromite. The olivine shows in places a tendency to pass into serpentine; but this is not largely present in the rock. Talc is a common alteration-product; and probably the anthophyllite may have resulted from alteration of enstatite. F. W. R.

Phillips, J. A. On the Chemical and Mineralogical Changes which have taken place in certain Eruptive Rocks of North Wales. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 423–430, pl. xix. (rock-sections).

Describes dioritic rocks of Penmaenmawr now extensively quarried, and a uralitic dolerite from near Dolgelly, giving analyses, and a description of the microscopic structure. T. G. B.

Potter, W. B. The Character and Composition of the Lignite Coals of Colorado. *Trans. Amer. Inst. Min. Eng.* vol. v. pp. 365–375.

Contains a table of analyses arranged in the geographical position of the coals, from N. to S., along the E. slope of the Rocky Mountains, beginning with the "Erie Coal" and down to the "Trinidad Coal" of South Colorado. R. B. N.

Quiroga, Prof. Francisco. Ofitas de Portolin y Casáres (Santander). [Serpentines of Santander.] *Bol. Inst. Libr. Enseñ. Madrid*, Año i. no. 10, p. 37.

Chemical and microscopical description of two varieties.

Rénard, Rev. A. On the Mineralogical Composition and the Microscopical Structure of the Belgian Whetstones. *Micr. Journ.* vol. xvii. pp. 269–281, woodcut.

The geological position and the mode of occurrence of the hones from the neighbourhood of Viel-Salm are first considered. These hones are obtained from rocks believed to be Cambrian, and the equivalents of the Tremadoc schists. Certain mineral constituents may be detected with a hand-lens; but the fine texture of the material renders a microscopic examination necessary. The result of a very careful examination of more than 70 sections is given; and the author concludes that "this rare rock of Salm and the neighbourhood presents a mineralogical composition such as I have never found in any of the rocks ordinarily designated razor-stones." E. T. N.

Rosenbusch, H. Mikroskopische Physiographie der massigen Gesteine. [Microscopic Petrology of Massive Rocks.] Pp. xii, 596. 8vo. *Stuttgart.*

The rocks are classed in 7 groups according to their principal component minerals. These groups are subdivided according to structural characters, and these again into families. Essentially a manual of descriptive petrology, treated from a microscopic point of view. Copious references are made to the works of other authors on Micro-petrology; and the literature of the subject is represented in the lists of publications which head the different sections. F. R.

Rutley, Frank. On Microscopic Structures in Tachylite from Slievenalargy, Co. Down, Ireland. *Journ. R. Geol. Soc. Ireland,* ser. 2, vol. iv. pt. 4, pp. 227–232, plate.

The ground-mass is a glass including many nearly spherical opaque-looking granules, with much minute magnetite, and a green ferruginous glass, probably closely allied to glauconite, with some other silicates. Rod-like bodies diverge from the different coloured lacunæ. The structural peculiarities appear to ally it to pitchstone or perlite.

The **Rev. S. Haughton** gives a Note on the Chemical Composition, with Analysis. The rock has nothing in common with pitchstone except its appearance. It belongs to trap-dykes of the Mourne District; and the large quantity of water from it shows it to be a trap dyke that has undergone metamorphism. He proposes to call it *Basaltic Pitchstone.* E. T. H.

Sandberger, F. On the Formation of Metallic Veins. *Canad. Nat.* n. ser. vol. viii. no. 6, pp. 345–362. Translated from *Berg-hütt. Zeit.* Nov.

Contains the results of observations carried on in the Rhenish Slate plateau and in the Primordial plateau of the Black Forest, to ascertain the composition of the so-called vein-stones, and also of the ores that occur in veins in the form of sulphuric, arsenical, and antimonial compounds. Several analyses are given. R. B. N.

Santesson, H. Kemiska Bergartsanalyser. I. Gneiss, hälleflintgneis ("eurite") and hälleflinta. [Chemical Analysis of Rocks; I. Gneiss, Hälleflintgneiss, and Hälleflinta.] Pp. 77. 8vo. *Stockholm. Geol. Survey of Sweden.*

Gives historical notes as to the determination, classification, and occurrence of the above great rocks. Many analyses of Swedish rocks, viz. 52 Gneiss, 69 Hälleflintgneiss (eurite), and 57 Hälleflinta, are systematically arranged and examined. Thinks it at present impossible to deduce the quantitative mineralogical composition of the Swedish gneisses. The chemical difference between the varieties of hälleflint-gneiss and hälleflinta is also insignificant. E. E.

Senft, Dr. Ferd. Lehrbuch der Gesteins- und Bodenkunde. [Textbook of Rocks and Soils.] Ed. 2. Pp. xvii, 416. 8vo. *Berlin.*

Describes the principal mineral constituents of rocks, the various classes and species of rocks, the effects on them of various agents producing decomposition, and the formation of soils and their influence on the growth of plants—the subject being treated specially with relation to agriculture, &c. T. G. B.

Smita, Arthur. Trachyt von Gleichenberg. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. p. 277.

Analysis of a trachyte from Gleichenberg, in Styria.

Sorby, H. C. The Application of the Microscope to Geology. (Anniversary Address to the Royal Microscopical Society.) *Micr. Journ.* vol. xvii. pp. 113–136, plate.

The subject of this Address as above given is treated of under the following headings:—The Structure of Stratified Rocks; Preparation of the Objects, &c.; On the Microscopical Character of Sands and Clays; Origin of the Material (viz. quartz, quartz in granite, quartz in schists, mica, &c., hornblende and schorl, felspars, pumice, iron oxides); General Conclusions; Sorting of the Material; Practical Application of the above-described General Principles; Identification of the Constituent Minerals; Application of similar Principles to thin sections of Rocks; Application of the above-described Principles to Special Cases, viz. Millstone Grit of S. Yorkshire, Sand of the Egyptian Desert, Sand derived from Schists, Clays, &c., Volcanic Ash Beds in British Strata. Concludes that by far the greater bulk of our British non-calcareous stratified rocks were originally derived from the chemical decomposition and mechanical breaking-up of various granitic and schistose rocks.
E. T. N.

Stelzner, Alf. [Erzgebirge-Gneiss.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 597–610.

Referring to criticisms of Kalkowsky, remarks that Freiberg geologists have not been unanimous in their views as to the origin of the Gneiss of the Erzgebirge, and that he has misunderstood Von Cotta, &c. Cotta has held that the red gneiss sometimes forms dykes, sometimes layer-veins, and at other times instead of being intrusive is a part of the Archæan series; and in this Stelzner agrees. Deprecates judging of the gneiss from a study of a part of the district. E. B. T.

Storer, Prof. F. H. [Phosphates and Potash in Rocks.] *Bull. Bussey Inst.* vol. ii. pt. i.

Streng, A., and J. H. Kloos. [Crystalline Rocks of Minnesota.] See p. 129.

The rocks are referred to 7 species:—*Melaphyre*, or basic augitic rocks, without hornblende, comprising 2 varieties—melaphyre-porphyry, and compact or granular melaphyre; *Hornblende-gabbro*, basic rocks with much diallage, but also containing hornblende; *Augite-diorite*, similar to the last group, but with diallage and hornblende intimately associated; *Quartz-diorite*, highly siliceous rocks, without augite; *Augite-quartz-diorite*, a similar rock with augite; *Syenite-granite*, or hornblendic granite; *Granite*. Each rock is described macroscopically and microscopically. F. W. R.

Struever, G. Studi petrografici sul Lazio. Parte prima. [Petrography of Latium. Part 1.] *Atti R. Ac. Linc.* ser. 3, *Mem.* vol. i. pp. 46–58. Abstract in *Trans.* vol. i. p. 29.

Describes hauyniferous and porous lava of erratic blocks, and a native lava of the porous scoriaceous variety locally called Sperone.

Svedmark, E. Om granat i en kambrisk lerskiffer från Lemmingstorp, Motala socken Östergötland. [Garnet in Cambrian Clay-slate from Province Östergötland, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 274–277.

Note on a microscopical examination of clay-slate.

Szabó, Prof. [On Trachyte.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. p. 635.

In a few remarks on the classification of the Hungarian trachytes, divides them thus:—1. Augite-anorthite-trachyte; 2. Amphibole-anorthite-trachyte; 3. Biotite-labradorite-trachyte; 4. Biotite-andesin-trachyte; 5. Biotite-orthoclase-trachyte. These are in chronological order, the last being the earliest (Eocene). E. B. T.

Taramelli, Prof. Torquato. Catalogo ragionato delle rocce del Friuli. [Classified Catalogue of the Rocks of Friuli.] *Atti R. Ac. Linc.* t. i. fasc. 2, *Trans.* pp. 49–51, and *Mem.* p. 545.

Thompson, W. The Sizing of Cotton Goods. *Journ. Soc. Arts*, vol. xxv. no. 1269, p. 360.

Notice of china-clay, with average of analyses, pp. 364, 365.

Törnebohm, A. E. Mikroskopiska Bergartsstudier. Nos. IX., X. [Microscopical Rock-studies.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 250–258.

IX. *Olivine-rock from Kettilsfjäll in Sweden.*—Gives a sketch of the microscopical structure and condition of the rock.

X. *Augite-porphyry from Strömstad, Sweden.*—Describes the mineralogical composition of the rock from several veins in granite. Shape of veins figured. E. E.

——. Om Sveriges vigtigaste diabas- och gabbro-arter. [The Principal Kinds of Diabase and Gabbro in Sweden.] *K. Svenska*

Vet.-Akad. Handl. Bd. xiv. no. 13, pp. 53. Abridged translation in *N. Jahrb.* Heft iii. pp. 258–274, Heft iv. pp. 379–393. See also GEOLOGICAL RECORD for 1876, p. 217.

Gives some hints as to the mode of determination of the triclinic felspars, the pyroxene minerals, olivine, titanic iron, and magnetite. Treats of the nomenclature of the diabase- and gabbro-groups, and describes the main types of these rocks as to their mineralogical composition, their mode of occurrence, and their age. The hyperites and hyperite-dolorites belong to the beginning of the Primitive period, the gabbros and gabbro-diorites to the end of the same period, and the diabases to the Silurian. E. F.

Traill, W. A. Granites and their Allied Rocks. *Proc. Belfast Nat. Hist. Phil. Soc.* Session 1876–77, pp. 29–49.

Described under the following heads:—Granites in confusion; Granite as a typical representative; Granites in origin; Granites in age; Granites in composition; Granites in variety; Granites in distribution and in economic or practical use. R. B. N.

Tween, A. Analyses of Ráníganj Coals. *Rec. Geol. Surv. Ind.* vol. x. pp. 155–158.

The results of analyses of 31 varieties. The average gives:—sp. gr. 1·39; fixed carbon, 53·2 p. c.; ash, 16·17; sulphur, 0·85.

Urba [Vrba], Carl. Die Grünsteine des Přibramer Erzreviers. [Greenstones of the Přibram Ore-district.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. pp. 223–242, woodcut.

The Silurian slates and sandstones of Přibram are penetrated by greenstones, which are connected with the occurrence of minerals. In deepening the Adalbert Shaft to 1000 metres, a greenstone occurred, which the author found to be a diabase. He then examined the other greenstones of the district, and found that most of them are also diabase. A beautiful diorite occurs at one locality, and at another a rock which is like many minettes; the latter contains much augite with a dark mica, and is described as an augite-minette. F. W. R.

Utschik, Jos. Trachyt von Gleichenberg. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. pp. 277, 278.

Analysis of a trachyte from Gleichenberg, in Styria.

Vierthaler. Ricerche Chimiche sui Calcari del Territorio di Trieste. [Chemical Examination of the Trieste Limestones.] *Boll. Soc. Adr. Trieste*, vol. iii.

Wadsworth, M. E. Notes on the Mineralogy and Petrography of Boston and Vicinity. *Proc. Boston Soc. Nat. Hist.* vol. xix. pp. 217–222.

Describes the microscopical structure of various doleritic rocks. Gives a list (6 pp.) of publications on the geology of Eastern Massachusetts. W. H. D.

Ward, J. C. On the Lower Silurian Lavas of Eycott Hill, Cumberland. *Micr. Journ.* vol. xvii. pp. 239–246, plate.

The object is to point out the value of microscopic research to the field-geologist. The stratigraphical position of the rocks examined is pointed out; and a section through the series of volcanic rocks of Eycott Hill is given, in which 17 beds are recognizable. Notes the results of a detailed microscopic examination of each bed and their chemical examination, with a table of analyses of Cumberland lavas. E. T. N.

Weiss, —. [Thuringian Porphyries.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 418–423.

Describes porphyries analogous to younger volcanic rocks, *e. g.* streaky porphyries with fluidal structure, lines curving round quartz or felspar crystals, vesicular porphyries, also sphærulitic, perlitic, and with large spheres. Though the large spheres are only concentric, and not radiate in structure to the eye, yet under the microscope they are seen to be identical in structure with the smaller sphærulitic type, and are considered only a variety thereof. E. B. T.

Whitwell, Thos. Iron Smelters' Pocket Analysis Book. *London and New York.*

Contains 156 analyses of ores, 32 of coal, and 40 of limestones.

Wigner, G. W. On Cleopatra's Needle. *Analyst*, no. 33, pp. 382–384.

Estimates the mineral composition as mica 9 p. c., quartz 22, feldspar 69. Gives analyses of weathered and unweathered specimens, and of the feldspar and mica. W. W.

Wurtz, Dr. Henry. Upon the Chemistry and Composition of the Porcelain and Porcelain Rocks of Japan. *American Chemist*, noticed in *Amer. Journ.* ser. 3, vol. xiii. pp. 389, 390.

Gives many analyses (4 copied in notice) of porcelain-rocks, one of which is termed *Kudaruyamite.*

See also:—

Baltzer, A. Metamorphic Rocks, Swiss Alps: p. 52.

Branco, W. Lavas of Herniker District: p. 56.

Bauerman, H. Analyses of Coal: see under *Encyclopædia Britannica,* at end of MISCELLANEOUS.

Calderon y Araña, G. Ophitic Eruptions: p. 57.

Curioni, G. Petrology of Lombardy: p. 59.

Dathe, E. Saxon Granulite and Gneiss: p. 59.

Dawson, G. M. Volcanic Rocks and Analyses of Coals, British Columbia: pp. 121, 122.

Déby, J. Analyses of Coals: p. 188.

Donayre, F. M. Eruptive Rocks of Almeria: p. 61.

Engelmann, H. Analyses of Brown Coals, Utah: p. 135.

Faber, G. L. Analysis of Limestone (Fiume): p. 62.

Fouqué. Lavas of Santorin: p. 108.

Gibson, G. A. Old Red Sandstone, Shetland: p. 15.

Ginth, Dr. H. E. Analyses of Petroleum: p. 66.

Gorceix, H. Rock known as Canga, Brazil: p. 135.

Hardman, E. T. Analyses of Irish Coals and Chalk: p. 17; and of Volcanic Rocks: under **Hull**, p. 47.

Harrison, W. J. Leicestershire Rocks: pp. 19, 20.

Haughton, Prof. S. Analyses of Irish Igneous Rocks: under **Nolan**, p. 31.

Hicks, H. Pre-Cambrian Rocks: p. 21.

Hill, Rev. E., and Prof. T. G. Bonney. Charnwood Rocks: p. 21.

Hughes, T. W. H. Analyses of Indian Coals: p. 141.

Hull, Prof. E. Dundalk Rocks: under **Nolan**, p. 31. Irish Volcanic Rocks: p. 47.

Hummel, D. Swedish Rocks: p. 74.

Hutchinson, Rev. T. N. Charnwood Rocks: p. 23.

Lasaulx, Dr. A. von. Irish Rocks: p. 25.

Liversidge, Prof. A. Analysis of Coals, &c.: p. 243.

MacMahon, C. A. Gneiss of Simla Himalayas: p. 143.

Marten, E. B. Rowley Basalt: p. 28.

Milne, Prof. J. Newfoundland Rocks: p. 126.

Munroe, H. S. Analyses of Coals, Japan: p. 166.

Nolan, J. Agglomerate near Dundalk: p. 31.

Pettersen, K. Olivine Rock in N. Norway: p. 87.

Pohlig, H. Petrography of Strehla: p. 89.

Richards, W. Analyses of Coals: p. 191.

Rosenbusch, H. Devonian Schists, analyses, &c.: p. 93.

Stache, Dr. G., and J. Conrad. Eruptive Rocks of E. Alps: p. 95.

Stoddart, W. W. Analyses of Dolomite and Red Marl: p. 38.

Taramelli, T. On Ferretto: p. 97.

Topley, W., and G. A. Lebour. Whin Sill: p. 41.

Traill, W. A. Precarboniferous Trap Dykes, Mayo: p. 41.

Wills, T. Arctic Coal (analysis): p. 117.

Wünsch, E. A. G. Columnar Sandstone, Junction of Granite and Old Red, Arran: p. 44.

[References to 'Analyses' are given in the GENERAL INDEX.]

SUPPLEMENT FOR 1874–1876.

Baltzer, [Dr.] A. Ueber eine eigenthümliche Gruppe vulcanischer Asche auf Vulcano. [Peculiar Volcanic Ash from Vulcano.] *Act. Soc. Helv. Sci. Nat.* pp. 49–55. [1875.]

Barcena, Mariano. The Rocks known as American Onyx. *Proc. Ac. Nat. Sci. Philadel.* pp. 166–168. [1876.]
Shows by analysis that this rock is a striped marble. See **Damour,** below.

Bureau, —, and Poisson, — Sur une roche d'origine végétale. [A Rock of Vegetable Origin.] *Compt. Rend.* lxxxiii. pp. 194–196. [1876.]

Cohen, Dr. [E.] On Amygdaloids from South Africa. *Cape Monthly Mag.* vol. x. p. 380. [1875.]

Damour, A. Sur un albâtre calcaire provenant du Mexique. [A Mexican Marble.] *Compt. Rend.* t. lxxxii. pp. 1085, 1086. [1876.] See **Barcena,** above.
Analysis of the "Tecali Onyx" gives 89 p. c. of carbonate of lime, the remainder being carbonates of magnesia, iron, and manganese.

Dana, J. D. On Metamorphism and Pseudomorphism. *Proc. Boston Soc. Nat. Hist.* vol. xviii. p. 200. [1876.]
Reply to Prof. T. S. Hunt's criticisms, published in 1875.

Daubrée, —. Expériences sur la schistosité des roches et sur les déformations des fossiles corrélatives de ce phénomène; conséquences géologiques de ces expériences. [Experiments on Cleavage and Deformation of Fossils.] *Compt. Rend.* t. lxxxii. pp. 710–716, 798–804. [1876.]
The theory of foliation being due to original deposition is rejected. The fan-structure of Mt. Blanc is described; it can be imitated by squeezing clay in a proper machine, and was probably produced before the rocks acquired their present consistency. W. H. D.

Dawson, Principal J. W. Note on specimen of Metadiabase from Connecticut Lake, collected and sliced by G. W. Hawes. *Amer. Journ.* ser. 3, vol. xii. p. 395. [1876.]

The rock contains fragments of apparently organic nature, but whether of animal or vegetable origin cannot be said.

Emmons, A. B. On some Phonolites from Velay and the Westerland. Pp. 34. 8vo. *Leipzic.* [1874.]

Fouqué, —. Recherches minéralogiques et géologiques sur les laves des dykes de Thera. [Volcanic Rocks of Santorin.] *Compt. Rend.* t. lxxxii. pp. 1141–1143. [1876.]

Petrological details of acid and basic lavas. Abstract of part of a larger work, see p. 108.

Frazer, Prof. Persifor, Jun. On the Age and Origin of certain Quartz Veins. *Proc. Ac. Nat. Sci. Philadel.* p. 36. [1876.]

Shows that quartz veins in dolerite have been formed by solution at a moderate temperature.

——. Notes on two Traps; a Case of Alteration of Earthy Sediments. *Proc. Ac. Nat. Sci. Philadel.* p. 60. [1876.]

——. Notes on some Palæozoic Limestones. *Ibid.* pp. 60–63.

Analyses by **A. S.** and **D. McCreath** of 10 Silurian Limestones from Pennsylvania.

——. On Certain Trap Rocks from Brazil. *Proc. Ac. Nat. Sci. Philadel.* pp. 119, 120. [1876.]

Petrological notes.

Giermansky, P. Rozbior chemiczny dwudziestudziewiecu gatunków wegli kopalnych z róznych Kopaln i pokladów Galicyi. [Analyses of Coals.] *Sprawozd. Kom. Fizyjogr. Krakow,* t. ix. pp. 1–115. [1875.]

Gives analyses of 29 Galician coals.

Gorceix, H. Sur une roche intercalée dans le gneiss de la Mantiqueire (Brésil). [Rock intercalated in Brazilian Gneiss.] *Bull. Soc. Géol. France,* sér. 3, t. iv. pp. 434, 435; *Compt. Rend.* t. lxxxii. pp. 688, 689. [1876.]

A sort of massive epidote. Analysis given.

Harting, M. P. [Fulgurites in Holland.] *Mém. Ac. R. Néerl.* t. xiv. pp. 22. [1874.]

Treats of the origin of fulgurites, noting some of the more important occurrences, and gives analysis by **Von der Star.**

Hauer, Carl v. Alcarazzathon von Kum in Persien. *Verh. k.-k. geol. Reichs.* pp. 113, 114. [1876.]

Gives analysis of calcareous clay used for vessels called Alcarazzas.

Hull, Prof. E. On the Microscopic Structure of the Red Quartz Porphyry from the Old Red Sandstone of Logan Water, above

Lesmahagow. *Trans. Geol. Soc. Glasgow*, vol. v. pt. i. pp. 25–28. [1875.]

Considers the subject under the following headings:—General Composition, Felspar, Quartz, Mica, Magnetite. Woodcuts of the quartz are given. R. B. N.

Hussak, E. Eruptivgestein von Krzeszowice. [Eruptive Rock, Krzeszowice.] *Verh. k.-k. geol. Reichs.* pp. 73-75. [1876.]

Husson, C. Recherche de la matière organique animale dans les terrains anciens. [Animal Matter in Old Formations.] *Compt. Rend.* t. lxxxiii. pp. 454–457. [1876.]

Refers to the bituminous matter of animal origin contained in Oolitic limestones and marls (France).

Hyatt, Prof. A. Remarks on the Porphyries of Marblehead. *Proc. Boston Soc. Nat. Hist.* vol. xviii. pp. 220-224. [1876.]

Observations supporting Bouvé's theory of the origin of Porphyry. See GEOLOGICAL RECORD for 1876, p. 202.

Jannettaz, E. Note sur une roche talqueuse de la Nouvelle Calédonie. [Talcose Rock from New Caledonia.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 449, 450. [1876.]

Describes an unctuous greenish-white rock, traversed by yellow veins of limonite, and containing 86·7 p. c. of talc, and 13·3 of pyrophyllite. Considerations as to formula and a description of its microscopical and other characters are given. R. E., Jun.

——. 1°. Sur l'analyse minéralogique de quelques roches de la Haute Savoie et sur leurs propriétés thermiques; 2°. Sur les applications de propriétés thermiques à la Cristallographie. [1. Analysis and Thermal Properties of Rocks from High Savoy. 2. Application of Thermal Properties to Crystallography.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 116–124. [1876.]

Gives analyses of several schistose rocks, and proportions of the axes of the thermal ellipses.

Jüptner v. Jonstorff, H. F. Analysen von zur Cementfabrication benützten Gesteinen eines Mergellagers zu Stein in Krain. [Marl for Cement-making, Stein, Illyria.] *Verh. k.-k. geol. Reichs.* pp. 169–171. [1876.]

Gives 20 analyses from different parts of the marl-beds.

Koch, Dr. A. Olivin-Gabbro aus der Frusca Gora. *Verh. k.-k. geol. Reichs.* 1876, pp. 235–237. See GEOLOGICAL RECORD for 1876, p. 82, and **Popovich**, p. 217.

Labat, —. Note sur le grès macigno de la Toscane. [Tuscan Macigno.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 446–449. [1876.]

Describes the varieties of Macigno.

Lagorio, A. Ueber die microscopische Gesteinsanalyse. [Microscopical Analysis of Rocks.] *Sitz. nat. ges. Dorpat*, Bd. iv. Heft 2, pp. 279, 280. [1876.]

Lasaulx, A. von. Études Pétrographiques sur les Roches Volcaniques de l'Auvergne, suivies d'une note sur les Roches désignées sur le nom d'Hémithrène et sur quelques autres du Plateau Gneissogranitique du département du Puy de Dôme, et de quelques autres notes. [Volcanic Rocks of Auvergne, Hemithrene of Puy de Dôme, &c.] Translated by **F. Gonnard.** *Mém. Acad. Clermont*, pp. 224; 2 pls. [1875.]

Marck, v. d. Ueber die Analyse eines angeblichen Fulgurits. [Analysis of supposed Fulgurite.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. i. *Corr.-Blatt.* p. 70. [1874.]

Mello, J. M. The use of the Microscope in Lithology. *Trans. Chesterfield Derbysh. Inst. Eng.* pp. 8. [1876.]

Describes the method and the results of microscopic investigation into the structure of rocks.

Meunier, Stan. Expériences et observations sur les roches vitreuses. [Vitreous Rocks.] *Compt. Rend.* t. lxxxiii. pp. 616–619. [1876.]

Experiments on obsidian, &c., for devitrification by heat, show that crystalline rocks are derived from vitreous, not *vice versâ*, and that vitreous rocks must be freed by fusion from volatile constituents before they can crystallize. W. H. D.

——. Recherches sur la devitrification des roches vitreuses. [Devitrification of Vitreous Rocks.] *Compt. Rend.* t. lxxxiii. pp. 1083–1085.

Reply to Michel-Lévy. See below.

Michel-Lévy, A. Note sur les roches porphyritiques des environs du lac de Lugano. [Porphyritic Rocks of L. Lugano.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 111–116. [1876.]

Describes 3 classes of porphyries—black, quartzose red or grey, and brown.

——. Observations sur l'origine des roches éruptives, vitreuses et cristallines. [Origin of Eruptive Rocks, Vitreous and Crystalline.] *Compt. Rend.* t. lxxxiii. pp. 749–752. [1876.]

Notes structure of perlite and rhyolite from Hungary. Thinks Meunier's experiments (see above) did not follow nature, and that crystalline rocks are mostly pro- not meta-morphic. W. H. D.

Möhl, H. Die südwestlichsten Ausläufer des Vogelsgebirge. Mikroskopische Untersuchungen der Basalte u. s. w. der Mamebene. [Examination of Basalt, &c. from the S.W. end of the Vogel Mts.] 14*th Ber. Offenb. Ver. Naturk.* pp. 51. [1874.]

Niedswiedski, J. Zur Kenntniss der Banater Eruptivgesteine. [Eruptive Rocks of the Banat.] *Jahrb. k.-k. geol. Reichs.* Bd. xxiii. *Min. Mitth.* pp. 255–262. [1874.]

Describes various rocks, giving analyses.

Pilide, C. D. Untersuchung eines Melaphyres von Pareukailor, in der Bukowina. [Bukowina Melaphyre.] *Verh. k.-k. geol. Reichs.* pp. 210–212. [1876.]
Gives analyses of melaphyre, copper-pyrites, and limonite.

Popovich, Prof. Alex. B. Ueber Gabbro-Gesteine aus der "Frusca Gora." *Verh. k.-k. geol. Reichs.* pp. 312, 313. [1876.]
Remarks on Dr. Koch's paper. See GEOLOGICAL RECORD for 1876, p. 82.

Rath, G. vom. Ueber die Sphärulitlava des Antisana. [Sphærulite-lava of Antisana.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. i. *Sitzungsb.* pp. 118–120. [1874.]

——. Ueber vulkanische Gesteine der Anden, mit besonderer Berücksichtigung des constituirenden Plagioklas. [Andean Volcanic Rocks and their Plagioclase.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. i. *Sitzungsb.* pp. 173, 174. [1874.]

——. Ueber eine Tridymit-Eruption auf der Insel Vulcano. [Tridymite-Eruption, Vulcano.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. ii. *Sitzungsb.* pp. 14, 15. [1875.]

Smith, Dr. R. A. A Study of Peat. Part 1. *Mem. Lit. Phil. Soc. Manch.* ser. 3, vol. v. pp. 281–345. [1876.]
Age and growth of peat, as compared with wood. History of the use of peat. Notes from Reports on the Irish Bogs. Analyses (quoted). Resins and Fats in peat. Use of peat as a water-holder and swamp-drier. Heating power of peat. Sanitary effects of peat-water and peat-smoke. W. H. D.

Stache, Dr. G. Die Eruptivgesteine des oberen Addagebietes (Veltlin) zwischen Bormio und Boladore. 2. Ueber die Zusammensetzung einer eruptiven Lagermasse im Gneissphyllit des Zwölferspitz. [Eruptive Rocks in the U. Adda District. Composition of a Sheet of igneous Rock in the Zwölferspitz Gneiss-phyllite.] *Verh. k.-k. geol. Reichs.* pp. 357, 358. [1876.]
Petrological descriptions.

Unger, Dr. H. Chemische Untersuchung der Contactzone der Steiger Thonschiefer am Granitstock von Barr-Andlau. [Chemistry of the Junction-rocks of Clay Slate and Granite at Barr-Andlau.] *N. Jahrb.* pp. 785–807. [1876.]
Analyses of many metamorphic and igneous rocks.

Velain, Ch. Étude microscopique des roches volcaniques de Nossi-Bé. [Volcanic Rocks of Nossi-Bé Island, W. of Madagascar.] *Compt. Rend.* t. lxxxiii. pp. 1205–1208. [1876.]
Description of microscopic structure.

METEORITES.

Alth, Dr. A. Sprawozdanie o kamykach dnia 20 Seerpnia 1876 r podczas burzy spadlych w Uhrynie. [Remarks on the Stones that fell during a storm at Uhrynia, Aug. 20, 1876.] *Rozpr. Ak. Umiej. Krakow*, t. iv.

Anon. [Meteorite from Brazil.] *Boston Journal of Chemistry.* Formula Fe_2 Ni.

Buchner, O. Der Meteorstein von Hungen. [The Hungen Meteorite.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iv. pp. 313–315.

Describes a fall of Meteorites witnessed May 17, 1877, near Hungen, in the Grand Duchy of Hesse-Darmstadt. The largest stone weighed over 86 grains. It is coated with a thin black rind, in which grains of iron are visible. On fracture it presents a grey ground-mass (mainly olivine), with many enclosures of iron and troilite; the chondritic structure is seen with difficulty. F. W. R.

Damour, A. Sur un fer métallique trouvé à Santa-Catarina (Brésil). [Metallic Iron from Santa Catarina, Brazil.] *Compt. Rend.* t. lxxxiv. pp. 478–481, with Remarks on the above by **M. Boussingault,** pp. 481, 482, also by **Prof. Daubrée,** pp. 482–485.

Gives an analysis of this supposed meteoric iron.

Daubrée, Prof. —. Expériences faites pour expliquer les alvéoles de forme arrondie que présente très-fréquemment la surface des Météorites. [Pitted Surface of Meteorites.] *Bull. Soc. Géol. France*, sér. 3, t. iv. p. 505. [See GEOLOGICAL RECORD, for 1876, p. 220.]

The pittings are probably due to the pressure of heated gases.

——. Observations sur la structure intérieure d'une des masses de fer natif d'Ovifak. [Internal Structure of Native Iron from Ovifak.] *Compt. Rend.* t. lxxxiv. pp. 66–70.

Notes the uncertainty existing as to the telluric or cosmic origin of this iron, as a proof of the remarkable likeness between deep earth rocks and meteorites. In illustration, an analysis is given of a specimen of cast iron obtained by **M. Terreil** by the reduction of a terrestrial peridote from the basaltic lava of Langeac (Haute-Loire); this iron contained a notable proportion of nickel. G. A. L.

——. Note sur la chute d'une météorite, qui a eu lieu le 16 Août 1875 à Feid-Chair, dans le cercle de La Calle, province de Constantine. [An Algerian Meteorite.] *Compt. Rend.* t. lxxxiv. pp. 70–72.

This meteorite was picked up immediately after its fall—the third time in three years that this has been done in Algeria.

Daubrée, Prof. Actions physiques et mécaniques exercées par les gaz incandescents et fortement comprimés, lors de la combustion de la poudre. Application de ces faits à certains caractères des météorites et des bolides. [Experiments with Gunpowder bearing on certain Characters of Meteorites.] *Compt. Rend.* t. lxxxiv. pp. 413–419, 526–531; 3 figs.

——. Expériences, d'après lesquelles la forme fragmentaire des fers météoriques peut être attribuée à une rupture sous l'action de gaz fortement comprimés, tels que ceux qui proviennent de l'explosion de la dynamite. [Experiments according to which the Fragmentary Form of Meteoric Iron may be attributed to Fracture by the Action of Highly Compressed Gases, such as those produced by the Explosion of Dynamite.] *Compt. Rend.* t. lxxxv. pp. 115–122; 2 figs.

——. Conséquences à tirer des expériences sur l'action des gaz produits par la dynamite, relativement aux météorites et à diverses circonstances de leur arrivée dans l'atmosphère. [Inferences from Experiments on the Action of the Gases produced by Dynamite, with reference to Meteorites and to certain Circumstances attending their Ingress into the Atmosphere.] *Compt. Rend.* t. lxxxv. pp. 253–259.

—— Recherches expérimentales, faites avec les gaz produits par l'éxplosion de la dynamite, sur divers caractères des météorites et des bolides qui les apportent. [Same subject as above.] *Compt. Rend.* t. lxxxv. pp. 314–319.

——. Constitution et structure bréchiforme du fer météorique de Sainte-Catherine (Brésil); déductions à tirer de ces caractères, en ce qui concerne l'histoire des roches météoritiques, et notamment l'association habituelle du carbone au sulfure de fer. [Brecciform structure of the Sta. Catarina Meteoric iron, &c.] *Compt. Rend.* t. lxxxv. pp. 1255–1260.

Flight, Dr. Walter. Meteorites and the Origin of Life. *Pop. Sci. Rev.* n. ser. vol. i. pp. 390–401.

Gives 10 instances of meteorites in which hydrocarbons have been found. Concludes that though there is no evidence of the existince of living germs in meteorites, yet that the cosmical bodies from which our meteorites were derived probably bore on their surface some form of organic beings. W. T.

Guignet, —. Sur le fer nickelé de Sainte-Catherine au Brésil. [Nickeliferous Iron from Sta. Catarina, Brazil.] *Compt. Rend.*

t. lxxxiv. pp. 1507, 1508. With observations on the above by **Prof. Daubrée**, pp. 1508, 1509.

The iron in question is undoubtedly a meteorite.

Lunay, —. Sur le fer nickelé de Sainte-Catherine. [Nickeliferous Iron of Sta. Catarina.] *Compt. Rend.* t. lxxxv. pp. 84, 85.

The iron was found in fragments in 14 places on the S. side of the Morro do Roccio, three kilometres from Rio San Francisco do Sul. Analyses of four specimens are given, with the following results:—Iron, 64, 56, 38, 50·8; Nickel, 34·6, 15·7, 18·8, 7·8 respectively. G. A. L.

Patrick, Prof. G. E. The Waconda Meteorite. *Trans. Kansas Ac. Sci.* vol. v.

Prendel, R. Description du Météorite de Vavilovka. Pp. 5. 8vo. *Cherbourg.*

Rohde, J. G. On the Non-Meteoric Origin of the Masses of Metallic Iron in the Basalt of Disko, in Greenland. Selected and translated from the original Danish paper of K. J. V. Steenstrup. *Min. Mag.* vol. i. no. v. pp. 143–148, plate. See **Steenstrup**—Geological Record for 1876, pp. 215, 216.

Gives objections to assigning a meteoric origin for these iron masses, from the mode in which they occur in the rock. Describes the basalt, and shows from examination of a basalt from Assuk, on the Waigat, that native iron does sometimes occur in basalt. T. G. B.

Shepard, Prof. C. U. Meteoric Stone of Rochester, Fulton Co., Indiana. *Amer. Journ.* ser. 3, vol. xiii. p. 207.

Smith, J. L. Examination of the Waconda Meteoric Stone, Bates County Meteoric Iron, and Rockingham County Meteoric Iron. *Amer. Journ.* ser. 3, vol. xiii. pp. 211–214.

Gives analyses.

——. A description of the Rochester, Warrenton, and Cynthiana Meteoric Stones, which fell respectively December 21st, 1876, January 3d, 1877, and January 23d, 1877; with some remarks on the previous falls of Meteorites in the same regions. *Amer. Journ.* ser. 3, vol. xiv. pp. 219–229, sketch map; and *Compt. Rend.* t. lxxxv. pp. 678–681.

The Rochester and Warrenton stones are pisolitic, the Cynthiana is brecciated; they consist respectively of:—Bronzite and pyroxenic minerals 46, 18, and 30 p. c.; Olivine minerals 41, 76, and 50; Nickeliferous Iron 10, 2, and 6; Troilite 3, 3·5, and 5·5; Chrome-iron ·15, ·5 and ·52. W. H. D.

——. Sur trois chutes récentes de pierres météoriques dans l'Indiana, le Missouri, et le Kentucky. [Falls of Meteorites in Indiana, Missouri, and Kentucky.] *Compt. Rend.* t. lxxxiv. pp. 398, 399.

Sorby, H. C. Structure and Origin of Meteorites. *Micr. Journ.* vol. xvii. p. 293.

Note on the structure of meteorites, with special reference to the possibility of their having been formed on the surface of the sun.

Tschermak, G. Der Meteorstein von Hungen. [Meteorite of Hungen.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iv. pp. 315, 316.

An appendix to **O. Buchner's** paper (see p. 218), describing a stone from the Hungen fall. Microscopic sections show large particles of iron and small grains of magnetic pyrites; there is also an opaque mineral, probably chromite or picotite. The transparent minerals appear to be olivine, bronzite, and perhaps diallage. F. W. R.

Wright, A. W. On the Gases contained in Meteorites. *Chem. News*, vol. xxxv. pp. 77–81. [See p. 222.]

SUPPLEMENT FOR 1875, 1876.

Barcena, Mariano. On certain Mexican Meteorites. *Proc. Ac. Nat. Sci. Philadel.* pp. 122–126. [1876.]

Describes several meteorites, giving analyses by **Profs. Meunier, Burkart**, and **Bergmann**, and **Messrs. Clark, Damour, P. Murphy, Pugh**, and **L. Rio de la Loza.** W. H. D.

Broadhead, G. C. On the Discovery of Meteoric Iron in Missouri. *Mines, Metals, Arts, & Railroad Journal*, September 1875.

Daubrée, A. [Meteoric Iron of Atacama.] *L'Institut*, p. 298. [1875.]

——. [Russian Meteorite of May 12.] *Ibid.* p. 316. [1875.]

Fonvielle, W. G. Les combustions météoriques. [Meteoric combustions.] *Compt. Rend.* t. lxxxii. p. 527. [1876.]

Genth, Dr. F. A. On the Pittsburg Meteoric Iron. *Report of the Geological Survey of Pennsylvania for* 1875. [1876.]
Gives analyses.

Guignet, E., and **G. Ozorio de Almeida.** Sur un fer météorique très-riche en nickel, trouvé dans la province de Santa-Catharina (Brésil). [Nickeliferous Meteoric Iron from Brazil.] *Compt. Rend.* t. lxxxiii. pp. 917–919.

A metallic mass Fe_2Ni stated to occur as a deposit. **M. Daubrée** adds a note on the meteoric iron of Disko, Greenland.

Meunier, S. [Composition and Origin of Meteorites.] *L'Institut*, pp. 393, 394. [1875.]

Mohr, Prof. On the Nature and Origin of Meteorites. *Chem. News*, vol. xxxiii. p. 68. [1876.]

Phipson, T. L. Sur les poussières métalliques de l'atmosphère [Meteoric Dust.] *Compt. Rend.* t. lxxxiii. pp. 364, 365. [1876.]

Shepard, Prof. C. U. Notice of the Meteoric Stone of Waconda, Mitchel County, Kansas. *Amer. Journ.* ser. 3, vol. xi. pp. 473, 474. [1876.]

A stone meteorite.

Smith, Prof. J. L. Recherches sur les composés du carbone pur dans les météorites. [Carbon compounds in Meteorites.] *Compt. Rend.* t. lxxxii. p. 1042, 1043. [1876.]

Abstract from a memoir on meteoric stones, &c., noting the occurrence of a sulphide of ethyl, $C_4H_6S_4$ or $C_4H_6S_5$.

——. Sur les combinaisons de Carbone trouvées dans les météorites. [Carbon Compounds in Meteorites.] *Compt. Rend.* t. lxxxii. p. 1507. [1876.]

The Ovifak (Greenland) iron contains a notable quantity of hydrocarbon.

——. Note sur une nouvelle météorite tombée le 25 mars à Wisconsin (Etats-Unis), et dont le caractère est identique à celui de la météorite de Meno. [Wisconsin Meteorite.] *Compt. Rend.* t. lxxxiii. pp. 161–163. [1876.] For above 3 papers, see also GEOLOGICAL RECORD for 1876, p. 221.

Tissandier, G. Sur la présence du nickel dans les poussières ferrugineuses atmosphériques. [Nickel in Cosmic Dust.] *Compt. Rend.* t. lxxxiii. pp. 75, 76. [1876.]

——. Analyse micrographique comparative de corpuscules ferrugineux atmosphériques et de fragments détachés de la surface des météorites. [Cosmic Dust and Particles of Meteorites.] *Compt. Rend.* t. lxxxiii. pp. 76–78. [1876.]

Figures particles found in Bohemia, France, and Saxony.

——. Sur une pluie de poussière tombée à Boulogne-sur-Mer le 9 octobre, 1876, et sur le mode de formation des pluies terreuses en général. [Muddy Rain.] *Compt. Rend.* t. lxxxiii. pp. 1184–1186. [1876.]

Analysis given. Microscopic examination shows the material to be like that of the Sahara.

Volger, O. Herkunft und Entstehung der Meteoriten. [Origin and Formation of Meteorites.] *Frankfurter Zeitung*, no. 40. [1876.]

Wright, Prof. A. W. On the Gases contained in Meteorites. *Amer. Journ.* ser. 3, vol. xi. pp. 253–262 and vol. xii. pp. 165–176. [1876.]

Gives the bulks of CO, CO_2, CH_4, H, and N from 12 metallic and 10 stony meteorites, with modes of examination. If comets be meteorites, the gases would supply the tails.

Yung, E. Du fer météorique. [Meteoric Iron.] *Compt. Rend.* t. lxxxiii. pp. 242, 243. [1876.]

MINERALOGY.

Sub-Editor F. W. Rudler, F.G.S.

[In preparing abstracts of mineralogical papers it has been thought right to adhere as far as possible to whatever system of nomenclature, chemical notation, and crystallographic formulæ may have been used by the authors. No attempt has therefore been made to secure uniformity on these points. Where two or more symbolical expressions for the same thing have been used, the first has generally been taken. In some cases exceptions to the foregoing rules have been made to avoid typographical difficulties.]

Achiardi, Prof. A. d'. Miniere di Mercurio in Toscana e Considerazioni generali sulla Genesi loro. [Mercury-Mines in Tuscany and their Origin.] *Atti Soc. Tosc. Sci. Nat.* vol. iii. fasc. 1, pp. 132–149, pl. viii. (rock-sections).

Describes mines of cinnabar and tetrahedrite in schists and limestones in 6 localities. Regards the mercury as deposited from solution by chemical reaction rather than by sublimation. Quotes analyses of tetrahedrite by Karsten and Bechi. W. H. D.

——. Minerali toscani (Ematite, Baritina, Farmacosiderite, Prenite, Epidoto, Sperchise). [Tuscan Minerals.] *Atti Soc. Tosc. Sci. Nat.* vol. iii. fasc. 1, pp. 160–165.

Description of these minerals from various localities. The crystallography of Barytine is more fully dealt with.

Allen, O. D. Chemical Constitution of Hatchettolite and Samarskite from Mitchell County, North Carolina. *Amer. Journ.* ser. 3, vol. xiv. pp. 128–131.

Tantalum and Columbium were separated by Marignac's method. Formula of *Hatchettolite*$=\overset{\text{II}}{R}_2\overset{\text{V}}{R}_2O_7+2\overset{\text{II}}{R}\overset{\text{V}}{R}_2O_6+4H_2O$; formula of *Samarskite*$=\overset{\text{II}}{R}_2\overset{\text{V}}{R}_2O_7+\overset{\text{II}}{R}_3\overset{\text{V}}{R}_2O_8$; in which $\overset{\text{II}}{R}$ represents one atom of a bivalent basic radical, or two of sodium, and $\overset{\text{V}}{R}$, Ta or Cb. T. W. D.

Anon. Notes on the Iron and Steel Industries of the United Kingdom in 1876–7. *Journ. Iron Steel Inst.* pp. 472–543.

References made to various iron-ores.

——. Argentiferous Mud [San Juan]. *West. Rev. Sci. Ind.* vol. i. pp. 270, 271.

Notices a paper by **Prof. Hanks.**

——. Precious Stones. *Globe Democrat.*

General remarks on gems.

Anon. Apatite: its mode of occurrence in Norway. *Canad. Nat.* vol. viii. no. 5, pp. 312–314. [Abstract of article on Norwegian Phosphates. *British Mercantile Gazette*, Feb.]

Arzruni, A. Ueber die Ergebnisse der Forschung auf dem Gebiete der chemischen Krystallographie. *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 396–406.

Reviews the progress of crystallography as to the influence of chemical constitution upon form from the time of Mitscherlich and the discovery of isomorphism downwards; notices the recognition by Des Cloiseaux of a potash-albite, microcline, isomorphous with albite, and infers similarly a monoclinic sodium-felspar, which can unite with orthoclase in the same way, being isomorphous. Further advances are expected from the study of crystals formed by artificial combinations, the conditions of whose origin are known. E. B. T.

——. Ueber den Einfluss der Temperatur auf die Brechungsexponenten der natürlichen Sulfate des Baryum, Strontium und Blei. [Influence of Temperature on the Indices of Refraction of the Natural Sulphates of Barium, Strontium, and Lead.] *Zeitsch. Kryst. Min.* Bd. i. Heft ii. pp. 165–192, woodcut.

Badoureau, —. Mémoire sur la Métallurgie du Nickel. [Metallurgy of Nickel.] *Ann. Mines*, sér. 7, t. xii. pp. 237, 340. Abstract in *Proc. Inst. Civ. Eng.* vol. liii. pp. 380–383.

Gives analyses of ores.

Bamberger, E. von. Glaukonit von der Insel Gozzo. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. pp. 271, 272.

Analysis of dark green grains of glauconite, carefully separated from a greensand from the Isle of Gozo. The most striking difference from other analyses of this mineral is in the small proportion of water (4·7 p. c.). F. W. R.

——. Salit von Albrechtsberg in Niederösterreich. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. p. 273.

Analysis of salite from Albrechtsberg in L. Austria.

Bauer, Max. Ueber das Krystallsystem des Kaliglimmers. [Crystalline System of Potash-mica.] *Monatsb. k. Akad. Wiss. Berlin*, p. 684.

The author has determined the angle which the plane of the optic axes makes with the basis, or perfect cleavage-plane. According to its optical behaviour the mica is monoclinic. The plane of the optic axes is perpendicular to the plane of symmetry. The angle of apparent bisectrix with cleavage-plane = 87° 5′; of true, 88° 18′. The angle of apparent optic axes, 64° 14′; of true axes, 40° 21′. The angle of apparent optic axes with normal to cleavage-plane, 32° 14′; of true axes, 20° 15′. F. W. R.

Baumhauer, H. Studien über den Leucit. [Leucite.] *Zeitsch. Kryst. Min.* Bd. i. Heft iii. pp. 257–273, pls. 2.

Vom Rath states that all leucite crystals are tetragonal, Hirschwald that they are regular. The author etches leucite, under the microscope when necessary, with hydrochloric and hydrofluoric acid, and finds that they are tetragonal. T. W. D.

——. Die Bedeutung der Rhomboëder- und Prismenflächen am Quarz. [On Faces of the Rhombohedron and Prism in Quartz.] *Ann. Phys. Chem.* n. F. Bd. i. pp. 157–159.

If the rhombohedra $+R$ and $-R$ in quartz are regarded as limiting forms of the trapezohedron, when m and $n=1$, then in *right* crystals of quartz $+R$ is the limit of the right positive and $-R$ of the left negative trapezohedron; while in *left* crystals $+R$ represents the left positive and $-R$ the right negative trapezohedron. Experiments in etching the faces of quartz with fused potash accord with these relations. F. W. R.

Becke, Friedrich. Ueber den Glaukodot von Hakansboe und den Danait von Franconia. [Glaucodote of Hakansboe and Danaite of Franconia.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft ii. pp. 101–108; 3 woodcuts.

Results of recent crystallographic researches.

——. Ueber die Krystallform des Zinnsteins. [Crystallization of Tin-stone.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. pp. 243–260; 2 plates.

A crystallographic memoir on cassiterite, summarizing previous researches, and adding much original matter: 26 distinct forms are known. The combinations have a local distribution; and the author recognizes 3 types:—1. Type of Bohemian and Saxon ores; 2. Type of the English mineral; 3. Type of the Pitkaranta ore, Finland. The unusual occurrence of the basis (001) in crystals from Schlaggenwald and Pitkaranta is noted. Sections of wood-tin are given. F. W. R.

——. Scapolith von Boxborough, Massachusetts. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. p. 267.

Analysis of scapolite from Boxborough.

——. Fahlerz vom Kleinkogel bei Brixlegg in Tirol. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. pp. 273, 274.

Crystals of tetrahedrite from near Brixlegg, in Tyrol, were analyzed, and yielded results indicating the following relations:—S 6·84; (As, Sb) 2; (Cu, Ag, Fe, Zn) 6·33. F. W. R.

——. Krystallisirter Vivianit in Säugethierknochen aus dem Laibacher Torfmoor. [Crystallized Vivianite in Mammalian Bones from Laibach Peat.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. pp. 311, 312.

Bones of deer and ox, from pile-buildings in peat at Laibach, show crystallized vivianite. Earthy forms of this mineral are common on bone, but crystals are rare. The Laibach mineral either forms aggregates of crystals, or occurs as small acicular crystals showing the combination:—100.010.110.111.101. F. W. R.

Bertrand, Emile. De la mesure des angles dièdres des cristaux microscopiques. [Measure of Angles of Microscopic Crystals.] *Compt. Rend.* t. lxxxv. pp. 1175–1178.

——. Note on the Law of Twinning and Hemihedrism of Leucophane. *Proc. Crystall. Soc.* pt. i. pp. 35–37, 2 figures; and *Phil. Mag.* ser. 5, vol. iii. pp. 357-359.

Berwerth, Dr. Friedrich. Untersuchung zweier Magnesiaglimmer. [Two Magnesian Micas.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft ii. pp. 109–112.

Analyses of:—1. *Phlogopite* from Edwards, St. Lawrence Co., New York, occurring in brown transparent plates, and containing 2·46 p.c. of baryta; 2. A *Vesuvian Mica,* occurring in blackish six-sided plates, green, in thin laminæ, associated with yellow idocrase, and differing in composition from other Vesuvian micas. F. W. R.

——. Chondrodit von Pargas. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. pp. 272, 273.

Most analyses of chondrodite and humite show considerable loss, which has not been explained. An analysis of Pargas chondrodite shows the presence of alkalies; and as the determination of these is often neglected, the discrepancy is explained. F. W. R.

——. Untersuchung der Lithionglimmer von Paris, Rožena und Zinnwald. [Lithia Micas.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iv. pp. 337–346.

Gives analyses of lithia-mica from Paris, Maine, U.S.; from Rožena, Moravia; and Zinnwald, Bohemia (zinnwaldite). Details of the analytical methods are explained. F. W. R.

Besnard, Dr. Anton. Die Mineralogie in ihren neuesten Entdeckungen und Fortschritten im Jahre 1876. [Mineralogical Literature of 1876.] *Corr.-Blatt. zool.-min. Ver. Regensb.* Jahrg. 31, pp. 9–27.

Under the headings:—i. Independent works; ii. Crystallography; iii. Pseudomorphs; iv. Structure, &c.; v. Occurrences; vi. Mineral Chemistry; vii. Analyses, new minerals; viii. Astropetrology. W. W.

Blondel, S. Jade. A Historical, Archæological, and Literary Study of the Mineral called Yu by the Chinese. Translated by **Dr. E. Foreman.** *Ann. Rep. Smithson. Inst.* for 1876, pp. 402–418.

Describes several varieties of jade, giving analyses of white jade.

Bolton, Prof. H. C. Application of Organic Acids to the Examination of Minerals. *Ann. New York Ac. Sci.* vol. i. pp. 36, plate; and *Chem. News*, vol. xxxvi. p. 249.

Describes the action of various organic acids on minerals. Those of citric acid are quoted in *Amer. Journ.* ser. 3, vol. xiv. pp. 495, 496.

Bombicci, L. Contribuzioni di Mineralogia Italiana. [Italian Mineralogy.] Pp. 56; 3 pls. 4to. *Bologna.*

Bowron, W. M. The Practical Metallurgy of Titanic Iron Ores. *Metall. Rev.* vol. i. pp. 309–316.

Analyses of ores—3 from America, 2 from Norway.

Bräuning, —. [The Lower Harz Smelting-Processes.] *Zeitschr. Berg-, Hütt. Salinenw.* Bd. xxv. p. 132. Abstract in *Proc. Inst. Civ. Eng.* vol. lii. pp. 347-355.

Description of the ores, with analyses—Lead, Copper, Zinc.

Brezina, Dr. A. Leonhardit aus dem Floitenthale. [Leonhardite from the Floitenthal.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft i. p. 98.

The crystals show the combination 110 . 001, are often aggregated, and are associated with chlorite and tabular calc-spar.

——. Grundform des Vesuvian. [Fundamental form of Vesuvian.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft i. p. 98.

Optical study of a crystal of manganese-idocrase from Ala, Piedmont.

Broadhead, Prof. G. C. Bitumen, Asphaltum, Petroleum, Pyroschists, and certain other solid Hydro-carbons. *West. Rev. Sci. Ind.* vol. i. pp. 209–224.

Describes the various hydrocarbons, with special reference to American localities.

——. On Barite Crystals from the Last Chance Mine, Morgan County, Missouri; and on Göthite from Adair County, Missouri. *Amer. Journ.* ser. 3, vol. xiii. pp. 419, 420.

——. Growth of Minerals. *Mines, Metals, Arts, and Railroad Journal.*

Describes various minerals, and their mode of development.

Brögger, W. C., and G. vom Rath. On certain large Crystals of Enstatite found by W. C. Brögger and H. H. Reusch, at Kjorrestad, near Bamle, South Norway. *Proc. Crystall. Soc.* pt. i. pp. 14–23, plate; *Zeitsch. Kryst. Min.* Bd. i. Heft 1, pp. 18–30, pl. 1.

Enstatite ($MgSiO_3$) has been abundantly obtained from cosmical and terrestrial sources, always presenting the same angles. These gigantic crystals, from 0·3 to 0·4 metre long, were found in apatite-veins in mica and hornblende slates. They occur in more or less elongated columnar forms, always broken at one end, and were, no doubt, originally implanted on the wall of the lode; the space between them was filled with silver-white or light-green talc. Des Cloizeaux showed from optical properties that enstatite crystallizes in the rhombic system. These large crystals are remarkably deformed, and are of pseudomonoclinic habit. The cause of this is unknown. T. W. D.

Brown, W. G. Analysis of a new Mineral containing Niobium, from Amhurst Co., Virginia. *Chem. News*, vol. xxxvi. pp. 158, 159.

Describes the method of analysis of a mineral containing a complex association of the rare metals Nb, Ta, Eb, Y, Ce, La, Di, U, Be, W, &c. Analysis shows 48·66 p. c. of Nb_2O_5 and Ta_2O_5, and 27·94 p. c. of Eb_2O_3 and Y_2O_3. F. W. R.

Bryan, St. George T. Analysis of Auriferous Cobalt-ore from Grant Co., Oregon. *Chem. News*, vol. xxxvi. p. 167.

In a quartzose gangue were strings and grains of a greyish-white metallic ore having a sp. gr. of 5·36. From analysis it may be calculated approximately to contain 76·88 p. c. of smaltite, 7·09 of chalcopyrite, 5·46 of arseniates (Hörnesite, erythrite, &c.), 9·71 of quartz, and traces of gold. F. W. R.

Bücking, H. Krystallographische Studien am Eisenglanz und Titaneisen vom Binnenthal. [Crystallography of Specular Iron and Titanic Iron-ore from the Binnenthal.] *Zeitsch. Kryst. Min.* Bd. i. Heft 6, pp. 562–582, pl. 1.

Calderon, L. Ueber einige Modificationen des Groth'schen Universalapparates, und über eine neue Stauroskopvorrichtung. [Modifications of Groth's Universal Apparatus, and a new Stauroscope.] *Zeitsch. Kryst. Min.* Bd. ii. Heft 1, pp. 68–73, fig.

Chester, A. H. On the identity of the so-called Peganite of Arkansas with the Variscite of Breithaupt and Callainite of Damour. *Amer. Journ.* ser. 3, vol. xiii. pp. 295, 296.

Gives recent analysis of a mineral, wrongly supposed to be Peganite, showing identity with Variscite (=Calainite).

——. On a fibrous variety of Sepiolite from Utah. *Amer. Journ.* ser. 3, vol. xiii. pp. 296, 297.

Gives analysis.

Church, [Prof.] A. H. Note on Uranocircite. *Min. Mag.* No. 7, pp. 234–236.

An analysis of Weisbach's new baryta-uranite, from Falkenstein, in the Saxon Voigtland, shows that it contains 8 molecules of water, of which 6 are expelled at about 20° C., the remaining 2 being retained even at 100° C. F. W. R.

——. A Test of Specific Gravity. *Min. Mag.* No. 7, pp. 237, 238, fig.

Recommends the use of Sonstadt's solution.

——. Note on "Romeite" from Borneo. *Min. Mag.* No. 7, pp. 239, 240.

The so-called "Romeite" is found, on analysis, to be only a variety of allophane, containing a little antimonious oxide.

Clarke, F. W. On the Iodates of Cobalt and Nickel: some Specific Gravity determinations; and an Analysis of Sylvanite from Colorado. *Amer. Journ.* ser. 3, vol. xiv. pp. 280–286.

Gives the first recorded analysis of Sylvanite from Grand View Mine, Colorado. This ore, after elimination of pyrites, gave Tellurium 58·91, Gold 29·35, Silver 11·74. T. W. D.

Cohen, Dr. E. Titaneisen von den Diamantfeldern in Süd-Afrika. [Titanic Iron from the S.-African Diamond Fields.] *N. Jahrb.* Heft vii. pp. 695–697.

A black substance is common among the diamond-yielding materials in S. Africa, and, being taken by the miners for black diamond, is called "Carbon." True "carbonate" does not occur with the African diamonds; and the substance in question is a titaniferous iron-ore. An analysis of samples from Du Toit's Pan is given. F. W. R.

Collins, J. H. Remarks on Gramenite from Smallacombe, and on the Chloropal group of Minerals. *Min. Mag.* No. 3, pp. 67–71.

Gives analysis of a mineral from Smallacombe, near Bovey Tracey, Devon, showing it to be *Gramenite.* Regards this as a distinct species from Chloropal. Suggests that a number of species, having the general formula $R_2H_6O_6 . 3SiO_2 + 2H_2O$, be associated as the "Chloropal group." In Gramenite $\ddot{R} = \frac{4}{5}Fe . \frac{1}{5}Al$. F. W. R.

——. Note on certain Black Quartz Crystals from Boscaswell Downs, Cornwall. *Min. Mag.* No. 4, pp. 115, 116, figs.

The crystals are of clear colourless quartz, highly charged with tourmaline, which under a high power is mostly colourless.

——. Note on Duporthite, a new asbestiform Mineral. *Min. Mag.* No. 7, pp. 226, 227.

Duporthite occurs in fibrous masses, occupying fissures in the serpentine of Duporth, near St. Austell. Assuming half the water to be basic, the analysis leads to the formula:—$3(Al_2O_3 . SiO_2 + 5(\frac{3}{5}Mg . \frac{1}{5}Fe . \frac{1}{5}H_2)O . SiO_2$. F. W. R.

Cossa, Alfonso. Ueber das Fluormagnesium. [Magnesium fluoride.] *Zeitsch. Kryst. Min.* Bd. i. Heft 2, pp. 207–211.

Obtained in the wet way a compound having the same formula ($MgFl_2$) as Sellaite. This fluoride can only be prepared in crystals by fusion. The crystals, like those of Sellaite, are tetragonal; they are described. T. W. D.

——. Sulla Molibdenide del Biellese. [Molybdenite of the Biellese.] *Atti R. Ac. Linc.* ser. 3, *Trans.* vol. i. pp. 206–208.

Gives analyses by **Prof. Manzoni** and **A. Sella,** and describes the action of heat, acids, &c. on Molybdenite.

——. Scoperta del Tallio, del Rubidio, del Litio e del Cesio nelle Isole Lipari. *Gazzetta Ufficiale,* Aug. 25.

Notes the discovery of thallium, rubidium, lithium, and cæsium, in a natural alum from Vulcano, by means of the spectroscope.

Crawford, J. C. An attempt at an Explanation of the origin of Mineral Veins, particularly those of Gold and Silver. *Trans. N. Zeal. Inst.* vol. ix. pp. 560, 561; *Proc.* p. 613.

Supposes mineral veins to have been formed in the depths of the sea, and theorizes thus:—The filling of metallic veins has chiefly taken place at a depth of about 2500 fathoms, or over; the precipitating agent has been carbonic acid; and precipitation may have proceeded from metals in the waters of the ocean, or in passes, or in water heated from below. R. E. jun.

Credner, Hermann. Ueber ein neues Vorkommen des Alunites, [New Occurrence of Alunite.] *Sitz. nat. Ges. Leipzig*, Jahrg. 4, No. 2, p. 21. Noticed in *N. Jahrb.* Heft viii. p. 833.

Concretions of *Alunite* have been found in white sand, belonging to the lowest stage of the Oligocene, in the Muldenthal, near Leipzig.

Dana, Edward S. Mineralogical Notes.—No. V. On the occurrence of Garnets with the Trap of New Haven, Connecticut. *Amer. Journ.* ser. 3, vol. xiv. pp. 215–218.

Garnets occur at East Rock and Mill Rock in dolerites, in the Mesozoic Sandstone of the Atlantic border. At East Rock they occur on vertical faces of trap columns far from sandstone, in dark rhombic dodecahedra having the formula $Ca_3FeSi_3O_{12}$, associated with magnetite, pyroxene, apatite, calcite, and free from titanic acid. At Mill Rock the garnets occur on the line of contact of trap and sandstone: crystals complex; quantity too small for analysis. T. W. D.

——. Ueber eine regelmässige Verwachsung von Quarz und Kalkspath. [Regular Growth of Crystals of Quartz with those of Calcite.] *Zeitsch. Kryst. Min.* Bd. i. Heft 1, pp. 39–42, fig.

——. A Text-Book of Mineralogy; with an extended Treatise on Crystallography and Physical Mineralogy . . . . with the co-operation of **Prof. J. D. Dana.** Pp. viii, 486, plate and 800 woodcuts. 8vo. *New York.*

Pp. 1–114, Crystallography. Pp. 115–168, Physical characters, especially optical properties. Pp. 169–192, Chemical Mineralogy. Pp. 193–397, Descriptive Mineralogy. Appendix, pp. 400–420, on Miller's System. Pp. 421–430, Drawing figures of Crystals. E. B. T.

Daubrée, Prof. —. Sur la présence de la Tridymite dans les briques zéolithiques de Plombières, et du quartz dans les laves péridotiques d'Oahu (archipel hawaïen). [Tridymite in the Zeolitic Bricks of Plombières, and Quartz in the Peridote-lavas of Oahu, Sandwich Is.] *Bull. Soc. Géol. France,* sér. 3, vol. iv. pp. 523, 524.

——. Formation contemporaine de zéolithes (chabasie, christianite), sous l'influence de sources thermales, aux environs d'Oran (Algérie). [Recent Zeolites formed by Thermal Springs near Oran.] *Compt. Rend.* t. lxxxiv. pp. 157–159.

In the concrete-work near Oran, chabasite and christianite are found both in the cement and in the vesicular hollows of the bricks, the former mineral showing a marked tendency to associate with débris of wood disseminated through the concrete. G. A. L.

Daubrée, Prof. —. Note sur les striés parallèles que présente fréquemment la surface de fragments de diamants, de la variété carbonado, et sur leur imitation au moyen d'un frottement artificiel. [Parallel Striæ on Carbonado Diamonds, and their Imitation by means of Artificial Rubbing.] *Compt. Rend.* t. lxxxiv. pp. 1277–1279.

——. Rapport sur un Mémoire de **M. Hautefeuille**, relatif à la reproduction de l'albite et de l'orthose. [Report on **M. Hautefeuille's** Memoir, see p. 236.] *Compt. Rend.* t. lxxxv. pp. 1043–1046.

Davies, T. Notes on Vauquelinite from Scotland and Cantonite from Cornwall. *Min. Mag.* No. 4, pp. 112–114.

Announces the occurrence of Vauquelinite on pyromorphite from Leadhills and Wanlockhead. Calls attention to specimens of Cantonite, or covellite after galena, from Wheal Falmouth and from Wheal George, Cornwall. F. W. R.

Davis, G. E. A New Process for the Production of Carbonate and Caustic Soda, ... &c. *Journ. Soc. Arts*, vol. xxv. no. 1278, p. 633.

Analysis of phosphate of alumina from Redonda, W. Indies, p. 634.

Delafontaine, Prof. On the Hermannotite of Shepard, and on the Samarskite of North Carolina. *Amer. Journ.* ser. 3, vol. xiii. p. 390 (letter).

Des Cloizeaux, Prof. A. Memoir on the three Types of Humite. *Proc. Crystall. Soc.* pt. i. pp. 6–12, 4 figures; also in *Phil. Mag.* 1876. See GEOLOGICAL RECORD for 1876, p. 227.

——. Supplementary Note to Professor **Des Cloizeaux's** Memoir on Humite. *Proc. Crystall. Soc.* pt. i. p. 13; and *Phil. Mag.* ser. v. vol. iii. p. 357.

——. Sur une nouvelle anthophyllite de Bamle, en Norvège. [A new Anthophyllite from Bamle, Norway.] *Compt. Rend.* t. lxxxiv. pp. 1473–1475.

——. Ein neuer Barytfeldspath. [New Baryta-felspar.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft i. pp. 99, 100.

——. Om Homilit och Erdmannit. [On Homilite and Erdmannite.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 385–387.

Dieulafait, Prof. L. La strontiane, sa diffusion dans la nature minérale et dans la nature vivante, à l'époque actuelle et dans la série des temps géologiques. Conséquences relatives aux eaux salifères. [Strontian, its Diffusion in Organic and Inorganic Nature, now and in Geological Times. Consequences as to Salt Waters.] *Compt. Rend.* t. lxxxiv. pp. 1303–1305. (Abstract.)

Concludes that Strontian is a constituent of all mineral waters.

Dieulafait, Prof. L. L'acide borique ; méthodes de recherches ; origine et mode de formation. [Boric Acid ; Methods of Research ; Origin and Mode of Formation.] *Compt. Rend.* t. lxxxv. pp. 605-607. (Abstract.)

The boric acid of Stassfurt, Tuscany, and elsewhere is of sedimentary origin. All sea-water contains boric acid, the presence of minute traces of which can be recognized with certainty by means of spectrum-analysis. G. A. L.

Dixon, —. On a white Earthy Mineral from the head of the Monilla R., N. S. Wales. *Journ. R. Soc. N. S. Wales* for 1876, *Proc.* pp. 290–291.

Like the so-called " Meerschaum " from the Richmond River.

Doelter, C. Beiträge zur Mineralogie des Fassa- und Fleimserthales. [Mineralogy of the Fassathal and Fleimserthal.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft i. pp. 65–82.

Gives analyses of Fassaite. Describes new localities for contact-minerals. Describes magnetite from the Mulatto, epidote from Viezena, magnetite and anorthite from the Monzoni, magnetite as a contact-product from Monte Comon, pyrites from Viezena and Monzoni, and various minerals from the melaphyre and tourmaline-granite of the Mulatto. F. W. R.

——. Zur Kenntniss der chemischen Zusammensetzung des Augits. [Chemical Composition of Augite.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. pp. 279–296.

Analyses of several varieties of Augite, and discussion of the results.

Domeyko, —. Sur les minéraux de bismuth de Bolivie, du Pérou et du Chili. [Bismuth-minerals of Bolivia, Peru, and Chile.] *Compt. Rend.* t. lxxxv. pp. 977, 978.

These are :—Bolivite ; Bismuthine ; a double sulphide of bismuth rich in copper ; Taznite ; Daubréite ; a compact earthy hydrated oxide of bismuth ; a hydrated silicate of bismuth ; native bismuth, and Tellurium-bismuth (an alloy of bismuth and silver). G. A. L.

Egleston, T. —. Boracic Acid in Lake Superior Iron Mines. *Trans. Amer. Inst. Min. Eng.* vol. v. pp. 131, 132.

The Lake Superior ores contain white specks, which, on being tested by **Mr. Iles**, were found to consist of a borate of lime and magnesia, probably a new mineral. R. B. N.

Ellis, W. H. A California Borax Deposit. *Canad. Journ.* n. s. vol. xv. pp. 328, 329.

In San Bernardino County, in the bed of a dry lake, covered with a deposit of various salts, native borax or *tincal* is found, nearly pure, in large crystals. An analysis of the borax is given. R. B. N.

Ferrero, —. Nitriera naturale in Val di Comino. [Deposit of Nitre in Process of Formation in the Val di Comino.] *Ann. Staz. Agr. Caserta*, ann. v.

——. Relazione sopra un minerale trovato a Lusciano. [Account of a Mineral from Lusciano.] *Ann. Staz. Agr. Caserta*, ann. v.

——. Quantità di allume separati da Sabbie Leucitiche. [Amount of Alum extracted from Leucitic Sand.] *Ibid.*

Field, F. On Ludlamite, a new Cornish Mineral. *Proc. Crystall. Soc.* pt. 1, 6 figures; and *Phil. Mag.* ser. v. vol. iii. pp. 52–57.

Ludlamite is found associated with quartz, chalybite, vivianite, iron-pyrites, and mispickel. The mineral is described: its chemical composition corresponds to formula $7FeO, 2P_2O_5, 9H_2O$; its relation to vivianite is shown. **Prof. Maskelyne** has investigated the crystallographical properties of the mineral, which occurs in the oblique system. The elements of the crystal are given. T. W. D.

Förstner, H. Ueber Natronorthoklas von Pantellaria. [Sodium-orthoclase from Pantellaria.] *Zeitsch. Kryst. Min.* Bd. i. Heft 6, pp. 547–561.

Two varieties of orthoclase, rich in sodium, from Cuddia Mida and from Monte Gibele, are described; the first contains 7·31 p. c. of Na_2O, the second 7·42 p. c. Both are monosymmetric felspars, although their composition differs considerably from that of orthoclase, and their angles approximate to those of albite so far as is compatible with difference of crystallographical system. The existence of such felspars proves the dimorphism of the combination $NaAlSi_3O_8$; while the dimorphism of $KAl\,Si_3O_8$ has been proved by Des Cloizeaux's discovery of mikroline. T. W. D.

Foote, A. E. Mineralogical Catalogue. Pp. 50. *Philadelphia.*

Price list, giving names of all species, with composition, streak, cleavage, hardness, density, fusibility, and form.

Foster, [Dr.] C. Le N. On some New Mineral Localities in Cornwall and Devon. *Min. Mag.* No. 3, pp. 73–75.

The minerals are apatite, bismuthine, chiastolite, fluor-spar, leucopyrite, mispickel, molybdenite, scheelite, and tourmaline.

Fremy, E., and — Teil. Sur la production artificielle du corindon, durubis et de différents silicates cristallisés. [Artificial Corundum, Ruby, and other Crystalline Silicates.] *Compt. Rend.* t. lxxxv. pp. 1029–1035.

Frenzel, A. Mineralogisches aus dem Ostindischen Archipel. [Mineralogical Notes from the E. Indian Archipelago.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. pp. 297–309.

An account of minerals collected in Borneo, the Philippines, the

Moluccas, Timor, Flores, Singapore, Ceylon, and New Guinea. Associated with the native antimony is a mineral, apparently a new species, described as *Sarawakite*. It is probably tetragonal, is yellowish, and appears to contain a chloride of antimony. F. W. R.

Gamper, J. Lazulith von Krieglach. [Lazulite.] *Verh. k.-k. geol. Reichs.* No. 7, pp. 118–121.

——. Studien über Labradorite von Kiew. [Labradorite.] *Verh. k.-k. geol. Reichs.* No. 8, pp. 130–134.

——. Anorthit von Monzoni. [Anorthite.] *Verh. k.-k. geol. Reichs.* No. 8, pp. 134, 135.

Garnier, —. Minerais à base d'oxyde de nickel à l'usine des Septèmes. [Nickeliferous Minerals.] *Mem. Soc. Ing. Civ.* ann. 30.

Genth, F. A. Ueber einige Tellur- und Vanad-Mineralien. [Some Minerals of Tellurium and of Vanadium.] *Zeitsch. Kryst. Min.* Bd. ii. Heft 1, pp. 1–13; and *Amer. Journ.* ser. 3, vol. xiv. p. 423.

Four varieties of native tellurium from Colorado are described. They are all mixed with quantities of quartz varying from 8·9 to 35·91 p. c. A variety of Hessite from Dry Cañon, Utah, contains Au ·103, Ag 58·79 per cent. *Coloradoite*, a new mineral found in certain mines in Colorado, is uncrystallized, and has the formula Hg Te. *Calaverite* is found in mines in California and Colorado; its formula is $(\frac{7}{8}\mathrm{Au}, \frac{1}{8}\mathrm{Ag})\mathrm{Te}_2$. It is doubtful whether Bunsenin is not a variety of Calaverite. *Tellurite*, TeO_2, has been found in Colorado. *Magnolite*, new mineral, is an oxidation-product of Coloradoite, $\mathrm{Hg}_2\mathrm{TeO}_4$, named from Magnolia district. *Ferrotellurite*, new mineral, $\mathrm{Fe\,Te\,O}_4$, found in Magnolia district. *Roscoelite*: Roscoe's chemical determination of this mineral is faulty, impure specimens having been analyzed. Genth's analysis gives the formula $\mathrm{K\,(Mg\,Fe)\,(Al\,V)_4Si_{12}O_{32}+4H_2O}$. A certain green mineral found in Magnolia district, but impure, is probably a variety. *Volborthite* from Perm has the formula $(\frac{1}{8}\mathrm{Ba}\ \frac{3}{8}\mathrm{Ca}\ \frac{4}{8}\mathrm{Cu})_3\,\mathrm{V_2\,O_8+3Cu\,H_2\,O_2+12H_2\,O}$; it is nearly allied to Psittacinite. T. W. D.

Goldsmith, E. On Sonomaite. *Proc. Ac. Nat. Sci. Philadel.* for 1876, pp. 263, 264.

This new species, from Sonoma County, has the formula $\mathrm{Al_2\,O_3\,(SO_3)_3}$, $\mathrm{Mg\,O\,SO_3+33H_2O}$.

——. On Boussingaultite and other Minerals from Sonoma County, California. *Proc. Ac. Nat. Sci. Philadel.* for 1876, pp. 264–266.

The formula of a mineral, which may be Boussingaultite, is $\mathrm{4Mg\,O\,SO_3}$, $\mathrm{Am_2\,O\,SO_3+24H_2O}$.

——. Pickeringite from Colorado. *Proc. Ac. Nat. Sci. Philadel.* for 1876, pp. 333, 334.

Records occurrence, giving analysis, &c.

Groth, P. Ein Beitrag zur Kenntniss des Quarzes. [Contribution to a Knowledge of Quartz.] *Zeitsch. Kryst. Min.* Bd. i. Heft 3, pp. 297–301, fig. 5.

Gunn, H. H. On a new form of Phosphorite. *Min. Mag.* No. 6, pp. 209, 210.

Recently found in L. Silurian rocks near Kicheneff, in S. Russia, where it occurs in spherical masses with radiate structure.

Hahn, Dr. Daniel. On the Phosphorescence of Minerals. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 41–49.

Gives the effects produced on various minerals by light, electricity, friction, heat, &c. as regards self-luminosity. [See GEOLOGICAL RECORD for 1875, p. 243.] W. H. D.

——. On the Want of a Systematic Universal Nomenclature in Mineralogy. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 55–58.

Referring to the multiplicity of names by which minerals are known, and which are only intelligible to those who use the language to which they belong, suggests a binomial nomenclature, as in other natural sciences, *e. g. Augites manganiferus.* W. H. D.

Hall, T. M. Remarks on the Distribution of Minerals in North Devon. *Min. Mag.* No. 6, pp. 212, 213.

Hankel, —. [Photo-electricity of Fluor-spar.] *Ann. Phys. Chem.* p. 66.

Chemical rays affect the constitution of the crystal, producing the electrical peculiarities.

Hannay, J. B. On the Magnetic Constituents of Rocks and Minerals. *Min. Mag.* No. 4, pp. 101–105.

——. Examination of the Hydrous Constituents in Minerals. *Min. Mag.* No. 4, pp. 106–109.

——. On an easily constructed form of Goniometer. *Min. Mag.* No. 4, pp. 110–111, fig.

——. On some New Minerals from the Collection in the University of Glasgow. *Min. Mag.* No. 5, pp. 149–153, figs.

Arsenargentite, Ag_3As, probably from Freiberg; *Plumbomanganite,* $3Mn_2S \cdot PbS$, probably from the Hartz; and *Youngite,* $6ZnS \cdot 2MnS \cdot PbS$, occurring with the plumbomanganite. F. W. R.

——. On Bowlingite, a new Scottish Mineral. *Min. Mag.* No. 5, pp. 154–157.

Describes a mineral from Bowling, on the Clyde, as *Bowlingite.* It has also been found in the Cathkins Hills, near Glasgow. Its composition is complex, the general formula being $12SiO_2 \cdot 6MgO \cdot 3Al_2O_3 \cdot 2FeO \cdot Fe_2O_3 \cdot CaCO_3 \cdot 20H_2O$. F. W. R.

Hartley, W. N. Observations on Fluid-cavities. *Journ. Chem. Soc.* ser. 3, vol. ii. No. clxxi. pp. 241–249, plate.

A continuation. Many crystals of topaz were microscopically examined. Concludes that the temperature of the mineral at the time of its formation was probably near the critical temperature of water, but rather lower. The critical point of water is near the melting-point of zinc. Describes a number of rock-sections, which lead to the belief that carbon dioxide occurs but rarely in the cavities of the component minerals. A piece of rock-crystal has been found to contain gas-bubbles which may be rendered denser than water. A number of crystal-shaped cavities are described and figured. F. W. R.

Hartley, W. N. Mineral Cavities and their Contents. *Pop. Sci. Rev.* n. ser. vol. i. pp. 119–129; 10 woodcuts.

Sketches the history of research on this question; gives the results of experiments on cavities containing liquid carbonic acid in quartz, topaz, beryl, sapphire, and tourmaline, and a table of the "critical point" of carbonic acid in these minerals. W. T.

Hauer, Carl von. Krystallogenetische Beobachtungen. [Crystallogenic Observations.] *Verh. k.-k. geol. Reichs.* No. 3, pp. 45–51; No. 4, pp. 57–61; No. 6, pp. 90–95; No. 10, pp. 162–166; No. 17, pp. 296–299; Abstract in *Min. Mag.* No. 7, pp. 243–256.

Haughton, Prof. Samuel. On Graphic Feldspar from Co. Donegal. *Journ. R. Geol. Soc, Ireland*, ser. 2, vol. iv. pt. 4, pp. 225, 226.

The specimen was from the Belleek Pottery Works, Co. Fermanagh. Analysis proves it to be a mixture of 4·7 quartz and 95·3 orthoclase.

Hautefeuille, P. Reproduction de l'Orthose. [Artificial Orthoclase.] *Compt. Rend.* t. lxxxv. pp. 952–955.

The method followed in the production of orthoclase is like that previously described as having led to the reproduction of albite. Analyses are given. G. A. L.

Heddle, Prof. —. Analysis of Stilbite of an unusual form, from Faröe. *Min. Mag.* No. 3, pp. 91–92.

Most of the Faroe stilbite is of "sheafy" habit, but this occurs in square or rectangular prisms aggregated in rosettes. It was taken for either faröelite or thomsonite, until analysis showed it to be stilbite. F. W. R.

——. On the Mineralogy of Scotland.—Chap. 2. *Proc. R. Soc. Edin.* vol. ix. no. 98, p. 393; and *Trans. R. Soc. Edin.* vol. xxviii. pt. i. p. 197.

The results of analyses of specimens of orthoclase, albite, oligoclase, labradorite, andesite, anorthite, latrobite, &c.

Helmhacker, R. Gold von Sysertsk am Ural. [Gold of Sysertsk.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* pp. 1–12; 2 pls. (crystals).

Crystallographic study of 110 crystals of native gold from Sysertsk (Sissersk) in the Urals. The commonest form is 111; frequently the combination 111.110; also 111.311, and 111.110.311; rarely 111.201, and in a single instance 100.201. Describes the distortion of some crystals; the skeleton-forms of others; their drusy faces; the occurrence of twins, and hemihedral forms. F. W. R.

Hirschwald, J. Ueber Wachsthum und Zwillingsbildung am Diamant. [Diamond-crystals, their Growth and Twin-formations.] *Zeitschr. Kryst. Min.* Bd. i. Heft 2, pp. 212–217, pl. 1.

Certain crystals hitherto thought hemihedral are really holohedral.

How, [Prof.] H. Notes on some North American Pyrrhotites and other Minerals containing Nickel. *Min. Mag.* No. 4, pp. 124–127.

——. Contributions to the Mineralogy of Nova Scotia. *Min. Mag.* No. 7, pp. 257–260.

Continuation from *Phil. Mag.* Shows that Cryptomorphite and Priceite are not identical in crystalline form. Cites the occurrence of silicoborocalcite in nodules at Noel, Hants Co.; and gives a tabular scheme of the allied borates. F. W. R.

——. On the relative composition of Ulexite and Franklandite. *Chem. News*, vol. xxxv. pp. 189, 190.

Calls attention to the accuracy of his formula for Ulexite, and shows that the difference between this mineral and Franklandite consists in the presence in the latter of an additional molecule of sodium metaborate. F. W. R.

Hull, Prof. E. Sections of Chert, with remarks on its origin. *Quart. Journ. Micr. Sci.* vol. xvii. p. 190.

Sections of chert from the Carboniferous Limestone of various Irish localities confirm the opinion that the chert has replaced the limestone of the original rock, as corals, crinoids, &c. are to be seen in it preserved in silica. Replacement had probably taken place before the deposition of the overlying Yoredale shales. E. T. N.

——. Microscopic Structure of Noble Opal. *Quart. Journ. Micr. Sci.* vol. xvii. pp. 302, 303.

In a section of Noble Opal from Australia, in favourable positions, fissures (inferred to be due to the intersection of oblique planes with the plane of the thin slice) were seen to coincide with the changes of colour when polarized; and it was evident that the opalescence was intimately connected with, if not directly due to, the existence of such planes, which were thought to be due to shrinkage. E. T. N.

Hutchings, W. M. Notes on Specimens of Chrysocolla. *Chem. News*, vol. xxxvi. pp. 18, 19.

Much of the "Mexican ore," probably from L. California, consists of two varieties of chrysocolla—one being hard, vitreous, and bluish green; while the other is soft, earthy, and of a pale colour, sometimes almost white. Analyses of both varieties are given. The chief differences between them are as follows:—The vitreous mineral contains 67·07 p. c. of SiO_2, 24·95 of CuO, 0·55 of Al_2O_3, and 5·82 of H_2O; while the earthy mineral contains 46·45 of SiO_2, 37·15 of CuO, 3·65 of Al_2O_3, and 7·99 of water. Both are chrysocolla mixed with a large and variable amount of opal-silica. F. W. R.

Jernegan, J. L. Notes on a Metallurgical Campaign at Hall Valley, Colorado. *Trans. Amer. Inst. Min. Eng.* vol. v. pp. 560.

Gives analyses of ores of lead.

Kern, Sergius. On Russian Platinum-ore from the Oural Mountains. *Chem. News*, vol. xxxv. p. 88.

Gives analyses of ores from the Goroblagodatsky and Nishni-Tagilsk Districts.

——. Sur un nouveau métal, le davyum. [New Metal, Davyum.] *Compt. Rend.* t. lxxxv. pp. 72, 73, and *Chem. News*.

Gives an analysis of a platiniferous sand.

Kerr, W. C. Note on Uranium Minerals in North Carolina. *Amer. Journ.* ser. 3, vol. xiv. p. 496.

Records the occurrence of Uranite, Gummite, Uraconite, Torbernite, and Autunite at Flat Rock Mine, and of Samarskite at Grassy Creek Mine, Mitchell County. W. H. D.

Knop, A. Ueber den Schorlomit vom Kaiserstuhl. [Schorlomite from the Kaiserstuhl.] *Zeitschr. Kryst. Min.* Bd. i. Heft 1, pp. 58–64.

Points out the inaccuracy of methods of determining titanic acid. Schorlomite is really not found in the Kaiserstuhl; the mineral so called is either melanite or pyroxene. It is difficult to distinguish true American schorlomite from melanite, with which it is associated. T. W. D.

——. Dysanalyt, ein pyrochlorartiges Mineral. [Dysanalyte, a Mineral allied to Pyrochlore.] *Zeitsch. Kryst. Min.* Bd. i. Heft 3, pp. 284–296.

This mineral from Vogtsburg, previously taken for Perowskite, has the formula $\begin{matrix}6\mathrm{R\,Ti\,O_3}\\ \mathrm{R\,Nb_2\,O_6}\end{matrix}$, where R consists mainly of cerium, calcium, iron, sodium. Dysanalyte contains the merest trace of fluoride, and is either a combination of one molecule of $\mathrm{RNb_2O_6}$ with six molecules of $\mathrm{RTiO_3}$, or a mixture of the two isomorphous constituents. T. W. D.

——. Ueber Pseudomorphosen von Cimolit nach Augit im Basalt von Sasbach am Kaiserstuhl. [Pseudomorphs of Cimolite after Augite in the Basalt of Sasbach, on the Kaiserstuhl.] *N. Jahrb.* Heft vii. pp. 699, 700.

Koch, Dr. A. Mineralogisch-petrologische Notizen aus Siebenbürgen. [Mineralogical and Petrological Notices from Transylvania.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iv. pp. 317–336.

Describes:—1. New locality for Celestine, near Bacs, and gives analysis. 2. An efflorescence of Glauber Salt, near Klausenberg. 3. Structure of crystals of rock-salt from Maros-Ujvár. 4. Occurrence of Adularia, with native gold, at Verespatak. 5. Minerals of the basalt of the Persányer Mountains. 6. Rocks and Minerals of the Csicó mountain. 7. Elæolite and Sodalite of Ditró. F. W. R.

Koch, Dr. A. Ueber Eiskrystalle in lockerem Schutte. [On Ice Crystals in loose débris.] *N. Jahrb.* Heft v. pp. 449–473, pl.

Koenen, Von. Ueber einige interessante Mineral-Vorkommnisse. [Interesting Mineral Occurrences.] *Sitz. Ges. Beförd. gesammt. Nat. Marburg*, no. 2; *N. Jahrb.* Heft viii. pp. 833, 834.

Describes crystals of *Phacolite* in decomposed basalt from Stempel ($\frac{2}{3}P2 . -2R$); also crystals of Phillipsite, regarded as *Faujasite*, from the same place, and fine octahedral crystals of *Blende* from the Morgenstern Mine, near Hesselbach. F. W. R.

König, G. A. Ueber eine manganhaltige Varietät des Tremolites. [Manganiferous Variety of Tremolite.] *Zeitsch. Kryst. Min.* Bd. i. Heft 1, pp. 49, 50.

Hexaganit, described by E. Goldsmith in 1876 as a new mineral, is but a manganiferous variety of tremolite.

——. Ueber das Vorkommen von Astrophyllit, Arfvedsonit und Zirkon in El Paso Co., Colorado. [Occurrence of Astrophyllite, Arfvedsonite and Zirkon in El Poso Co., Colorado.] *Zeitsch. Kryst. Min.* Bd. i. Heft 5, pp. 423–433.

These minerals are imbedded in massive grey quartz. In hand specimens, astrophyllite and zirkon are inseparable, while arfvedsonite occurs isolated in the quartz. Hitherto astrophyllite has only been found at Brevig, in Norway, and there associated with arfvedsonite and zirkon. The three minerals are described chemically and physically. **H. Bücking** describes the optical properties of the astrophyllite. T. W. D.

Kokscharow, N. v. Ueber das Krystallsystem und die Winkel des Glimmers. [Crystallography of Mica.] *Mém. Ac. Imp. St. Pétersb.* sér. 7, t. xxiv. no. 9.

All micas are orthorhombic with monoclinic habit; the plane angle of the base and fundamental prism is 120°. Ratio of axes is c (vertical) : $\bar{b} : \breve{a} = 2{\cdot}84953 : 1{\cdot}73205 : 1$. W. H. D.

——. Ueber Walnewit. [Walnewite.] *Mém. Ac. Imp. St. Pétersb.* sér. 7, t. xxv. no. 4, pp. 22.

Description of a new mineral from S. Ural. It was first held to be monoclinic chlorite (Klinochlore), and afterwards to be a variety of xanthophyllite. A series of crystallographic observations determined its true character. Cleavage basal, very complete. H.=4·5. Sp. gr. 3·093. Colour leek- or bottle-green. Dichroic. Analysis is given. W. G.

——. Walnewit, eine neue Varietät des Xanthophyllits. [Walnewite, a New Variety of Xanthophyllite.] *Zeitsch. Kryst. Min.* Bd. ii. Heft 1, pp. 51–54; 2 figs.

See above.

Kokscharow, N. von. Versuch die problematische Krystallisation des Perowskits zu erklären. [Crystallization of Perowskite.] *Bull. Ac. Imp. St. Pétersb.* t. xxiv. pp. 300–304.

Describes and figures crystals of Perowskite. See GEOLOGICAL RECORD for 1875, p. 407.

Koninck, Dr. L. L. Recherches sur les Minéraux belges. (4^e notice.) Sur la Kaolinite (Pholérite) de Quenast et du terrain houiller. *Bull. Ac. R. Belg.* sér. 2, t. xliv. pp. 733–739, pl. (microscopic appearances of crystals of Kaolinite).

Gives analyses of minerals regarded as pholerite and nacrite, and shows, by a comparison of their chemical composition and by the identity of the angles of the minute crystals which compose these substances, that they may be regarded as identical with Kaolinite. Proposes to include pholerite, nacrite, lithomarge, and kaolin under the name Kaolinite, restricting the term kaolin to the more or less pure varieties employed in manufactures. F. R.

——. Recherches sur les Minéraux belges. (5^e notice.) Sur la présence de l'apatite crystallisée dans l'étage salmien. *Bull. Ac. R. Belg.* sér. 2, t. xliv. pp. 740, 741.

Notes the occurrence of small crystals of apatite in quartz veins at Salm-Château, associated with Dewalquite and decomposed felspar.

Kopp, Hermann. [Tetrahedrite.] *N. Jahrb.* Heft i. pp. 62, 63.

Calls attention to the occurrence of Tetrahedrite in twins, formed of two interpenetrating tetrahedra, with edges at right angles to each other. F. W. R.

Krenner, A. Ueber Ungarns Anglesite. [Hungarian Anglesites.] *Zeitsch. Kryst. Min.* Bd. i. Heft 4, pp. 321–334; 2 pls. From the Hungarian Academy of Sciences.

Krenner, Dr. J. A. Ueber das Bunsenin, ein neues Tellurmineral. [Bunsenin, a new Tellurium ore.] *Termész. Füz.* Bd. i. pl. i. *Magyar*, pp. 33–35; *German*, pp. 56–58, pl. iii.

Describes the new species *Bunsenin* crystallographically.

Kuschel, Hr. [Milarite.] *N. Jahrb.* Heft ix. pp. 925, 926.

From the name of this mineral it is generally supposed to occur in the Val Milar. It is now found that this reputed locality is false, and that the mineral occurs in the Val Giuf. It should therefore have been called *Giufite*, instead of *Milarite*. F. W. R.

Lasaulx, Prof. A. von. On the Discovery of Tridymite in the Trachyte Porphyry of Co. Antrim. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. 4, p. 227.

This rare form of silica was discovered in the quarries of Tardree in 1876. The rock is so rich in tridymite as to be a Tridymite-trachyte like some of the Andesian rocks of S. America. The mineral occupies little drusy cavities in the rock. E. T. H.

Lasaulx, Prof. A. von. [Aerinite, Tridymite.] *N. Jahrb.* i. pp. 59–62.
Corrects the analysis of the new species *Aerinite*. Reports the discovery of *tridymite* in Ireland.

——. Krystallographische Notizen. [Crystallographical Notices.] *Zeitschr. Kryst. Min.* Bd. i. Heft iv. pp. 359–370, pl. 1 and 1 woodcut.
Discusses the crystallography of specimens of Fluorite from Striegau, from Königshayn in Silesia, and from Kongsberg.

Laspeyres, H. Mineralogischen Bemerkungen. [Mineralogical Observations.] *Zeitschr. Kryst. Min.* Bd. i. Heft ii. pp. 193–206, plate; Heft iv. pp. 344–358, plate; Heft vi. pp. 529–540, plate.
1. Maxite and Leadhillite. Discusses the crystallographical form of Maxite and the chemical composition of Leadhillite, and maintains that Leadhillite from Sardinia is a new mineral. 2. Aragonite from Oberstein on the Nahe. 3. Polysynthetic Macle of Augite from Bell, near Laach. 4. Crystals of Analcime from Kerguelen Isles. 5. Cruciform Macles of Orthoclase from Cornwall. 6. Crystals of Topaz from Saxony and Bohemia. 7. Apparent Hemimorphism of Topaz. 8. Crystallographical and Optical Examination of Glauberite. T. W. D.

Lehmann, O. Ueber physikalische Isomerie. [Physical Isomerism.] *Zeitschr. Kryst. Min.* Bd. i. Heft ii. pp. 97–131, plate.
Physical isomerism, allotropy, polymorphism, the three states in which a substance may exist, are all to be comprehended within the one term Physical Isomerism. T. W. D.

——. Ueber das Wachsthum des Krystalle. [Growth of Crystals.] *Zeitsch. Kryst. Min.* Bd. i. Heft v. pp. 453–496; 2 pls.
The conditions under which substances crystallize are reducible to:—1, Withdrawal of solvent; 2, Chemical precipitation; 3, Solidification after fusion; 4, Condensation of vapour; 5, Isomeric changes in solids; 6, Electrolysis. The first four conditions are considered essentially the same. The phenomena are grouped thus:—I. Formation of normal crystals; II. of crystals of anomalous form; III. of crystals of anomalous structure. Group I. is not discussed, because the circumstances unfavourable to the formation of crystals of anomalous form are favourable to the growth of normal crystals. Most of the experiments involve the use of the microscope, the application of which is explained in detail. In considering group II. the views of Vogelsang and Behrens are shown to be insufficient to explain the phenomena. The anomalous forms of group III. are considered under the headings of Krümmung and Verzweigung, *i. e.* production of curved or twisted forms and of branched forms. The frequent occurrence of twin crystals and the appearance of efflorescences are explained. The general causes which produce crystals of anomalous form or structure are:—increasing rapidity of crystallization, increasing insolubility of the substance, and increasing viscosity of the solvent. T. W. D.

Lemberg, J. Ueber Silicatumwandlungen. [Changes in Silicates.] Pp. iv, 103. 8vo. *Dorpat.*

Lewis, W. J. Notice of Crystallographical Forms of Glaucodote. *Proc. Crystall. Soc.* part i. pp. 31–34, plate; and *Phil. Mag.* ser. 5, vol. iii. pp. 354–356.

——. Crystallographic Notes. *Proc. Crystall. Soc.* pt. i. pp. 37–40, plate; and *Phil. Mag.* ser. 5, vol. iii. pp. 453–456.

Describes:—i. The remarkable development of the faces of a crystal of barium-nitrate and its tetartohedrism. ii. Certain peculiarities of a crystal of sphene from the Tyrol. iii. A crystal of gold in the British Museum. T. W. D.

——. Krystallographische Notizen über Baryumnitrat und Sphen. [Crystallographic Notes on Barium-nitrate and Sphene.] *Zeitsch. Kryst. Min.* Bd. ii. Heft i. pp. 64–67; 5 figs.

Liebisch, Th. Zur analytisch-geometrischen Behandlung der Krystallographie. [Application of Analytical Geometry to Crystallography.] *Zeitsch. Kryst. Min.* Bd. i. Heft ii. pp. 132–154.

——. Zur analytisch-geometrischen Behandlungen der Krystallographie. [Application of Analytical Geometry to Crystallography: continuation.] *Zeitsch. Kryst. Min.* Bd. ii. Heft i. pp. 74–90.

——. Ueber den Zusammenhang der geometrischen Gesetze der Krystallographie. *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 515–533.

Mathematically treated. It is sought to show the relation between the three crystallographic laws—that of angles for a given temperature, that of the rationality of the indices, and that of symmetry. E. B. T.

——. [Symmetry of Twin-Crystals.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 625–628.

Liversidge, Prof. Archibald. On the Formation of Moss Gold and Silver. *Journ. R. Soc. N. S. Wales*, vol. x. pp. 125–134; and *Chem. News*, vol. xxxv. pp. 68–71.

Experiments on the artificial production of these forms of gold and silver, and its bearing on the origin of capillary varieties of native metals. F. W. R.

——. The so-called Meerschaum from the Richmond River. *Journ. R. Soc. N. S. Wales*, vol. x. p. 240.

A white and porous hydrous silicate of alumina, sometimes said to contain leaf impressions; colour white. Low sp. gr. (=1·168) is remarkably characteristic; in other respects it answers to *Cimolite.*

R. E., Jun.

Liversidge, Prof. Archibald. On Black and Ruby Tin Ore. *Journ. R. Soc. N. S. Wales*, vol. x., *Proc.* p. 290.
Note on the above from Vegetable Creek, New England.

——. Report upon Mineral and other specimens examined for the Mining Department, during the year 1876. *Annual Report Dept. Mines N. S. Wales* for 1876, pp. 181–184.
Gives the physical characters and analyses of a number of samples of coal, auriferous quartz, chrome iron ore, auriferous vein stuff, carbonaceous earth, &c. R. E., Jun.

Lobisch, Dr. W. F. Muscovit von Soboth, Steiermark. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. p. 271.
Analysis of Muscovite from Soboth, Styria.

Ludwig, E. Ueber den Milarit. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iv. pp. 347–352; 3 figs.
A new analysis of Milarite leads to the following formula:—$Si_{12}\,Al_2\,Ca_2\,KHO_{30}$. The physical properties of the mineral are described by **Prof. Tschermak.** F. W. R.

Ludwig, Rudolf. Die Mineralien in den Drusen des Melaphyrs von Traisa und dem Basalte des Rossbergs. [Minerals in Melaphyre and Basalt.] *Notizbl. Ver. Erdk. Darmstadt*, F. 3, Heft 16, pp. 129, 130.

——. Mineralien und Versteinerungen aus der Umgegend von Hering, Wiebelsbach, Gross- und Klein-Umstadt. *Notizbl. Ver. Erdk. Darmstadt*, F. 3, Heft 16, pp. 161–163.

Mallet, J. W. On Sipylite, a new Niobate, from Amherst County, Virginia. *Amer. Journn.* ser. 3, vol. xiv. pp. 397–400.
Occurs with allanite on the N.W. slope of Little Friar Mountain. Two formulæ are proposed, the first excluding and the second including the water:—$R''_2M^{v}_2O_8\,.\,4R''_2M^{v}_2O_7$ and $R''_3M^{v}_2O_8$: the second is more probable. The mineral is described. T. W. D.

——. Note on the Fluid contained in a Cavity in Fluor-spar. *Journ. Chem. Soc.* no. clxxvi. pp. 144, 145.
Describes the examination of a cube of green fluor-spar from Alston Moor. The included liquid is probably water, certainly not carbon dioxide, though it may be a hydrocarbon or an aqueous solution of hydrofluoric acid. F. W. R.

Maskelyne, Prof. N. S. Note on the Optical Characters of Ludlamite. *Phil. Mag.* ser. 5, vol. iii. pp. 135–137.

——. Additional Note on Ludlamite. *Phil. Mag.* ser. 5, vol. iii. p. 525.

Mello, Rev. J. M. Quartz: its Varieties and Modes of Formation. *Sci. Goss.* vol. xiii. pp. 73–75, 97, 98.

——. Note on a peculiar form of Quartz Crystals from America. *Min. Mag.* No. 4, p. 123.

Michel-Lévy, A. Note sur divers états globulaires de la Silice. [Globular State of Silica.] *Bull. Soc. Géol. France*, sér. 3, t. v. pp. 140–146, pl. 2.

Describes the optical and microscopic characters of small globules of quartz in the banded eurites of Les Settons and Cussy-en-Morvan, the deportment of these under polarized light, and the microscopic inclosures which occur in them. These last consist of cavities, either empty or containing gas; and in some of them fixed bubbles have been observed under a magnifying-power of 1400 diameters, which, when heated to 50° C., underwent no perceptible change. These inclosures are usually arranged along concentric zones of accretion in the quartz-globules; but in one instance they showed a somewhat radial disposition. The granules of quartz in some of the druses in the euritic porphyry of Les Settons contain not merely gas-pores, but also inclosures with comparatively large fixed bubbles of gas, and, since they are unaffected by a moderate rise of temperature, the inclosures in which they occur are regarded as vitreous matter. The globular quartz solidified before the cessation of the movement which gave rise to the fluxion-structure of the rock. Concludes that it is a link between colloid and crystallized silica. Observations by **M. Vélain** follow, and tend to confirm these views. F. R.

——. Sur un nouvel état globulaire du quartz entièrement cristallisé suivant une seule orientation cristallographique. [Globular Condition of Crystallized Quartz.] *Compt. Rend.* t. lxxxiii. pp. 1301–1304.

Microscopical description.

Miller, Prof. W. H. On a new Form of the Reflective Goniometer. *Proc. Crystall. Soc.* part i. pp. 1–6, figure.

In this instrument, the construction of which is said to be simple, the circle is horizontal. By its use certain sources of error are eliminated, and observations facilitated and made more accurate. For the faint signal the author adopts the image, in a dark glass mirror, of a screen with a narrow vertical slit covered with thin paper; and for the bright signal the reflection of sunlight from the mirror of a heliostat with adjustable slit. T. W. D.

Moore, Dr. J. E. Preliminary Notice of the Discovery of a New Mineral Species. *Amer. Journ.* ser. 3, vol. xiv. p. 423.

Hetærolite occurs at Sterling Hill, New Jersey. It is closely allied to chalcophanite. Formula—$ZnO . MnO . MnO_2$.

Moutier, T. [Polymorphism in Crystals.] *Bull. Soc. Philomath. Paris,* sér. 7, t. i. pp. 31–34.

The change in form of crystals under pressure and heat depends upon the position of the axes of elasticity, and may place the specimen in another system. G. B.

Müller, Richard. Untersuchungen über die Einwirkung des kohlensäurehaltigen Wassers auf einige Mineralien und Gesteine. [Influence of Water containing Carbonic Acid on certain Minerals and Rocks.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft i. pp. 25–48.

A posthumous paper describing results of experiments on various minerals exposed to the action of water charged with CO_2. All the substances experimented on were more or less attacked. The following bases were converted into carbonates:—CaO, FeO, MnO, CoO, NiO, K_2O, Na_2O. With alkaline silicates, such as adularia, a small quantity of silica is always dissolved, probably as hydrate. Alumina is slightly soluble. Adularia resists longer than oligoclase. Hornblende is more easily decomposed than felspar. Solvent action is more facilitated by increased pressure than by prolonged digestion. Of all silicates examined olivine was the most easily attacked. F. W. R.

Naumann, C. F. Elemente der Mineralogie. Ed. 10. Edited by **Dr. Ferdinand Zirkel.** Pp. 714; 891 woodcuts. 8vo. *Leipzig.*

The old classification is replaced by that based on composition, and large additions are made.

Neminar, Dr. Edmund. Nachtrag zur chemischen Analyse des Mejonits. [Analysis of Meionite.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft i. pp. 61–64.

Gives analyses which show less water than previous determinations, the CO_2 and Cl having previously been reckoned with the water.

Niedzwiedzki, J. Zur Kenntniss der Mineralvorkommen von Kalusz. [Mineral Deposits of Kalusz.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft i. pp. 95–97.

Notes on minerals from the salt-deposits of Kalusz, in E. Galicia. Some of the *Rock salt* shows a combination of cube and the tetrakishexahedron $\infty 02$; the latter form not hitherto observed in salt. *Sylvine* occurs as a fibrous variety; and *anhydrite* is also found. The salt-deposits are like those of Stassfurt. F. W. R.

Nies, August. Strengit, ein neues Mineral. [Strengite, a New Mineral.] *N. Jahrb.* Heft i. pp. 8–16, woodcut.

Strengite is a phosphate of iron, of the formula $Fe_2O_3 . P_2O_5 + 4 H_2O$. Crystallizes in the rhombic system, in forms resembling those of skorodite. Occurs at an iron-mine near Giessen. F. W. R.

Nilson, L. F. Om aphthonit och tetraëdrit från Gärdsjön i Vermland. [Aphthonite and Tetrahedrite from Lake Gärdsjö, in Wermland, Sweden.] *Œfv. K. Vet. Akad. Förh.* No. 5, pp. 15–21, and, in German, in *Zeitsch. Kryst. Min.* Bd. i. Heft v. pp. 417–422.

Analysis given, showing that the Gärdsjö mineral, known as aphthonite, is tetrahedrite. Formula: $2[4R^2S . Sb^2S^3]+4RS . Sb^2S^3$.

Nordenskiöld, A. E. Mineralogiska meddelanden. [Mineralogical Notes.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 282–286, 376–384.

3. Tantalic-acid minerals from Utö, Sweden. Microlite, Manganotantalite and Cassiterite are described. Analyses given.

4. New minerals from Långban, Sweden. Description of the following minerals:—*Atopite*: 2 analyses given; formula $\dot{R}^2\overset{\cdot\cdot\cdot\cdot\cdot}{Sb}$. *Monimolite*. *Ekdemite*: analysis given leading to the formula $\dot{Pb}^5\ddot{As}+2PbCl$. *Hydrocerussite*, probably with the formula $2\dot{Pb}\ddot{C}+\dot{H}$. *Hyalotekite*: analysis (not finished) has given $SiO^2=39{\cdot}62$, $PbO=25{\cdot}30$, $BaO=20{\cdot}66$, $CaO=7{\cdot}00$, some Al^2O^3, KO, &c. *Ganomalite*: the analysis leads to the formula $(\dot{Pb}, \dot{Mn}, \dot{Ca}, \dot{Mg})\ \ddot{Si}$. *Jacobsite*: analysis given; formula $\dot{Mn}\,(\overset{\cdot\cdot\cdot}{\bar{Fe}}, \overset{\cdot\cdot\cdot}{\bar{M}}n)$. E. E.

Paijkull, S. R. Mineralogiska notiser. [Mineralogical Notes.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 350–352.

1. *Eukrasite*, a new mineral from Brewig, in Norway. The analysis given leads to the formula $(\frac{3}{8}RO^2+\frac{1}{6}R^2O^3+\frac{1}{4}RO) . SiO^2+2H^2O$. 2. *Picrotephroite* from Långban, Sweden. The analysis shows that the mineral has the formula of tephroite, $2RO . Si . O^2$, with a part of the manganese replaced by magnesium. 3. *Manganic serpentine* from Långban, Sweden. The analysis leads to the formula $4RO . 3SiO^2+2H^2O$. E. E.

Parke, G. H. On the Occurrence of Vermiculite in England. *Proc. Geol. Soc. W. Riding Yorksh.* n. s. pl. iv. pp. 254–257.

Occurred in granitic boulders on Walney Island and elsewhere, in Lancashire. Dana's description, with analysis, is quoted; and new analyses are given. see Geo. Record for 1878. p. 24. W. H. D.

Patrick, Prof. G. E. The Iola Gas Well. *Trans. Kansas Ac. Sci.* vol. v.

Penfield, S. L. On the Chemical Composition of Triphylite from Grafton, New Hampshire. *Amer. Journ.* ser. 3, vol. xiii. pp. 425–427.

The analysis confirms Rammelsberg's formula, $R_3PO_4+R_3P_2O_8$.

Pichler, Adolf. Jamesonit von Wiltau. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iv. p. 355.

Analysis of Jamesonite from Wiltau.

——. Tirolische Mineralien. *N. Jahrb.* Heft i. p. 63.

Notes on new Tyrolese minerals.

Pisani, F. Examen chimique de la turnérite. [Chemical Examination of Turnerite.] *Compt. Rend.* t. lxxxiv. pp. 462–464.

Gives the following analysis:—Phosphoric Acid 28·4, Oxide of Cerium, Lanthanium 68·0.

——. Description de plusieurs minéraux. [Descriptions of several Minerals.] *Compt. Rend.* t. lxxxiv. pp. 1509–1512.

1. Triphane from Brazil. 2. On Anthophyllite from Bamle. 3. Tephroïte from Långban, in Sweden. 4. Pharmacosiderite from the La Garonne mine (Var). Analyses of the first three are given.
G. A. L.

Purnell, S. On Ionite, a new mineral. *Mining and Scientific Press*, March 24. Quoted in *Amer. Journ.* ser. 3, vol. xvi. pp. 153, 154 (1878).

A hydrocarbon from the Pliocene lignite of Ione valley, California.

Quiroga, Francisco. Precipitacion de los metales puros per los Sulphuros naturales. [Precipitation of Pure Metals by means of Natural Sulphides.] *Bol. Inst. Libr. Enseñ.* no. 4, p. 13.

Tries to show by experiment that the precipitation of pure metals by means of sulphides will explain the existence in the mines of Horcajo of native silver with galena. J. F.

——. Fosforita concrecionada agatoida, del Cerro del Castillo Belmez (Córdova). [Concretionary Agatoid Phosphorite from the Hills of Castillo Belmez, Cordova.] *Bol. Inst. Libr. Enseñ.* no. 8, p. 29.

Describes the chemical characters of the mineral, and its appearance under the microscope, and by polarized light. It presents all the characteristics of being composed of phosphate of lime and hydrated colloidal silica. J. F.

——. Sobre la reversion de la Hornblenda al Piroxeno. [Change of Hornblende into Pyroxene.] *Bol. Inst. Libr. Enseñ.* no. 14, p. 53.

Draws attention to the microscopic structure of certain minerals as showing the above change.

Rammelsberg, Prof. C. Ueber Nephelin, Monacit und Silberwismuthglanz. [A Silver-bismuth Glance, &c.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 77–81.

A fresh analysis of vesuvian nepheline leads to the formula

$$\left\{\begin{matrix} 5(\mathrm{Na}^2\ \mathrm{AlSi}^2\mathrm{O}^8) \\ \mathrm{K}^2\ \mathrm{AlSi}^4\mathrm{O}^{12} \end{matrix}\right\}$$

a union of uni- and bi-silicate. Monacite from Arendal of sp. gr. 5·174 had the composition $(\mathrm{Ce}, \mathrm{La}, \mathrm{Di})^2\mathrm{P}^2\mathrm{O}^8$. An ore associated with fahl-ore, zinc-blende, &c., from Peru, has the composition $\mathrm{Ag}^2\mathrm{S}+\mathrm{Bi}^2\mathrm{S}^3$, and is named silver-bismuth glance. E. B. T.

——. Ueber die Zusammensetzung des Aeschynits und Samarskits.

Zeitsch. deutsch. geol. Ges. Bd. xxix. pp. 815–819; and *Monatsb. k. preuss. Ak. Wiss.* p. 656.

A fresh analysis of Aeschynite agrees with that of Marignac; the probable formula deduced is $R^2Nb^2O^8 . 3(L, Th)O^2$, in which R is cerium, didymium, &c. In samarskite from Miask the niobium oxide amounted to 55 per cent.; the formula obtained is $\left\{ \begin{matrix} 8(\not{R}^2Nb^6O^{21} \\ \not{R}^2U^5O^{21} \end{matrix} \right\}$.
E. B. T.

Rath, G. vom. Mineralogische Mittheilungen. Neue Folge. [Mineralogical Communications: New Series.] *Zeitsch. Kryst. Min.* Bd. i. Heft i. pp. 1–17, 2 pls.; Heft vi. pp. 602–617, plate.

1. Crystallization of gold. Explains the crystallographical structure of certain scales, threads, and needles of native gold. 2. Formation of peculiar macles of Speiskobalt. 3. Rutile in forms of specular iron from Binnenthal, and in octahedra from Arkansas. 4. Rare growth of Bournonite crystals. 5. Calcite from Bergen Hill, New Jersey. 6. New crystallized telluride of gold, called, by Krenner, Bunsenin. As the name Bunsenin is already appropriated, it is proposed to call this new telluride of gold, *Krennerite*, after its discoverer. The formula is $Au\,Te^4$.
T. W. D.

——. Ueber eine neue krystallisirte Tellurgoldverbindung, den Bunsenin Krenner's. [On Krenner's *Bunsenine.*] *Monatsb. k. Ak. Wiss. Berlin,* pp. 292–296.

A mineral obtained from Nagyag, in Transylvania, mistaken first for sylvanite, proved to be the same mineral which Krenner had described under the name of *Bunsenin*, or an isomorph. It crystallizes in the rhombic system, with axial ratios:—a (brachy): b (macra): c (vertical) $= 0{\cdot}940706 : 1 : 0{\cdot}504455$. Qualitative analysis shows gold, tellurium, and in some varieties silver.
F. W. R.

——. Ueber Pandermit, ein von Muck entdecktes Mineral. [Pandermite, a Mineral discovered by Muck.] *Sitz. niederrhein. Ges. Nat. Heilk.* 2 July.

A mineral subtance from Panderma, on the Black Sea, regarded as boracite, has been studied by Muck. Analysis shows it to be a hydrous borate of calcium, of the formula $2CaO . 3B_2O_3 . 3H_2O$. It is therefore not boracite, but stands near to borocalcite. It is now named *Pandermite.*
F. W. R.

——. Ueber rosarothe Anorthite von der Alp Pesmeda. [On Rose-red Anorthite from the Pesmeda Alp.] *Sitz. niederrhein. Ges. Nat. Heilk.* 2 July.

This felspar occurs on the S. side of Monzoni, and is remarkable for its beautiful red colour. The colour is discharged on heating, when the felspar becomes white.
F. W. R.

Ratton, J. J. L. Handbook of Common Salt. 8vo. *Madras.*

Readwin, T. A. Mineral Growth. *Mines, Metals, Arts, & Railroad Journal.*

——. Note on Doubtful Minerals. *Min. Mag.* No. 3, pp. 84–90.
A list of minerals which appear in text-books, but are not satisfactorily determined.

——. On Mineral Growth at ordinary temperatures and under ordinary conditions. *Min. Mag.* No. 5, pp. 158–184.
Argues in favour of the growth or the spontaneous increase of minerals, especially gold. Cites instances of the exudation of minerals from their matrix, in his own cabinet. F. W. R.

——. Further Notes on Mineral 'Growth.' *Min. Mag.* No. 7, p. 228.

——. Notes on some Norwegian Minerals. *Min. Mag.* No. 7, pp. 229–233.
Describes specimens from the Kongsberg Silver-mines, illustrating the phenomenon of mineral growth.

Reynolds, J. E. On the Composition of Lievrite, as determined by Mr. Early's Method. *Chem. News*, vol. xxxvi. pp. 85, 86.
Analysis, by **Early**, of a fine crystal from Elba, according to his method of analyzing ferroso-ferric silicates. The result showed 31·83 p. c. of FeO, and 20·16 of Fe_2O_3, with 13·71 of CaO. Its composition may be expressed by the formula $R_2O_3 . 6RO . 4SiO_2$, where $6RO = 4(Fe, Mn)O + 2CaO$. F. W. R.

Riley, E. On the Estimation of Manganese in Spiegelcisen, and of Manganese and Iron in Manganiferous Iron Ores. *Journ. Iron Steel Inst.* pp. 52–80; discussion, pp. 81–103.
Contains several analyses.

Robert, Dr. Eug. [The Filling-up of Fissures in the Chalk by Flint.] *Compt. Rend.* t. lxxxiv. pp. 1170, 1171.
Refers this form of flint to exudation from the sides of the fissures.

Rudler, F. W. Agate and Agate-working. *Pop. Sci. Rev.* n. ser. vol. i. pp. 23–37, pl. ii.
Chiefly refers to the Oberstein works. The agates occur as amygdaloids in melaphyre, a rock erupted through the Coal Measures of Saarbrücken. The silica of the agates has probably been derived from the decomposition of labradorite. Reviews the theories as to the means of deposition of the silica within the cavities, and describes the methods of working and staining the stone. W. T.

——. On two new species recently described by Prof. Von Lasaulx. *Min. Mag.* No. 3, pp. 81–83.
The species are *melanophlogite* and *aerinite.*

Ruskin, Prof. John. The Ethics of the Dust. Ten Lectures to Little Housewives on the Elements of Crystallization. Ed. 2. Pp. xvii, 244. 8vo. *Orpington, Kent.*

A reprint of Ed. 1, with new preface (pp. vii–xiii).

Sadebeck, Alex. Ueber die Krystallisation des Struvits. [Crystallization of Struvite.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft ii. pp. 113–126; Appendices, p. 221, and Heft iv. pp. 353, 354.

The results of recent measurements and of experiments in etching the mineral.

Santos, J. R. Analysis of Native Antimony Ochre from Sevier Co., Arkansas. *Chem. News,* vol. xxxvi. p. 167.

The ochre is straw-yellow, and is produced by alteration of the stibnite with which it is associated. Sp. gr. 5·58. Analysis leads to the formula $2Sb_2O_4 . H_2O$. It may be a mixture of cervantite and stibiconite. F. W. R.

——. Examination of an unusual form of Stibnite. *Chem. News,* vol. xxxvi. p. 167.

——. Analysis of Aluminous Chrysocolla from Utah. *Chem. News,* vol. xxxvi. pp. 167, 168.

A vitreous variety, too absorbent to allow the sp. gr. to be determined, contained 10·78 p. c. of alumina. It conforms to the normal metasilicate formula for chrysocolla, $Cu\,SiO_3 . 2H_2O$, with excess of water, and with one half the copper replaced by an equivalent amount of aluminium. F. W. R.

Schmidt, Alexander. Zirkon von Podsedlitz. *Termés. Füz.* Bd. i. pt. 1, Magyar, pp. 35–37; German, pp. 59, 60, pl. iv.

——. Cœlestin von St. Angelo. [Celestine from St. Angelo.] *Termés. Füz.* Bd. i. pt. 1, Magyar, pp. 38, 39; German, pp. 60, 61, pl. iv.

——. Cerussit von Schemnitz. *Termés. Füz.* pt. 3, Magyar, pp. 177–179; German, p. 204, pl. xii.

These 3 papers consist of crystallographic descriptions.

Schrauf, Prof. Alb. Morphologische Studien an der Mineralspecies Brookit. [Brookite.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Bd. lxxiv. pp. 535–558, plate.

Describes 3 types, all referred to the Monoclinic system, instead of the usually accepted Rhombic. Type I. is from Tremadoc; its elements are $a : b : c = 0{\cdot}844149 : 1 : 0{\cdot}93887$, $\mu = 90° \, 20'$. Type II. is from New York State; its constants $a : b : c = 0{\cdot}846931 : 1 : 0{\cdot}93795$, $\mu = 90° \, 39'{\cdot}3$. Type III. from England, Russia, and Switzerland, differs little from a Rhombic form, $a : b : c = 0{\cdot}841419 : 1 : 0{\cdot}943441$, $\mu = 90° \, 6'{\cdot}5$. The angles calculated from these, together with the observed ones (some being new), are set down in tables. E. B. T.

Schrauf, Prof. Alb. Neue Mineralvorkommnisse im Graphit von Mugrau, Böhmen. [New Mineral Occurrences in the Graphite of Mugrau, Bohemia.] *N. Jahrb.* Heft iii. pp. 251–257.

The new species *Ihleite* is described. It is a sulphate of iron, produced by alteration of pyrites disseminated through the graphite. The other minerals obtained from the graphite-workings are *chloropal* and *calcite.* F. W. R.

——. Die krystallographischen Constanten des Lanarkit. [Crystallographical Constants of Lanarkit.] *Zeitschr. Kryst. Min.* Bd. i. Heft i. pp. 31–38, plate.

——. Bemerkungen über optische Symmetrieverhältnisse mit besonderer Rücksicht auf Brookit. [Relations of optical symmetry, with especial reference to Brookite.] *Zeitschr. Kryst. Min.* Bd. i. Heft iii. pp. 274–283.

——. Ueber Gismondin. [Gismondine.] *Zeitschr. Kryst. Min.* Bd. i. Heft vi. pp. 596–601; 5 woodcuts.

Discusses the crystallography of the mineral.

Schroeckinger, J. von. Sphärosiderite von sehr hohem Mangangehalte aus Ungarn. [Highly manganesiferous Sphærosiderite from Hungary.] *Verh. k.-k. geol. Reichs.* No. 7, pp. 114, 115.

——. Szmikit, ein neues Mangansulphat. [*Szmikite,* a New Sulphate of Manganese.] *Verh. k.-k. geol. Reichs.* No. 7, pp. 115–117.

Contains $MnSO_4+H_2O$. From Felsöbanya. Named after Bergrath Szmik.

——. Pošepnyt, ein neues Harz aus Californien. [*Posepnyte,* a new Resin from California.] *Verh. k.-k. geol. Reichs.* No. 8, pp. 128–130.

Contains $C_{22}H_{36}O_4$. Found by Pošepny in the Great Western Mercury Mine.

——. Fluorit, als neues Mineralvorkommen in dem Quecksilberbergwerke zu Idria. [Fluorite, a new occurrence in the Mercury Mines of Idria.] *Verh. k.-k. geol. Reichs.* No. 8, p. 130.

Schröder, H. Das Sterengesetz. *Sitz. k.-bay. Ak. Wiss.* Bd. vii. pp. 302–322.

Seligmann, G. Mineralogische Notizen. [Mineralogical Notices.] *Zeitschr. Kryst. Min.* Bd. i. Heft iv. pp. 335–343.

Crystallographical descriptions of:—Fahlerz from Horhausen; Gismondine; Natrolite; regular growth of crystals of Rutile with magnetite; Electric Calamine.

Sella, C. Q. Primi Elementi di Crystallografia. Ed. ii. 8vo. *Turin.*

Sella, C. Q. Sulla esistenza del Realgar e dell' Orpimento nei monti di Santa Severa, provincia di Roma. [Realgar and Orpiment in the Santa Severa Mountains, Rome.] *Atti R. Ac. Linc.* ser. 3, vol. i. p. 66.

These minerals occurred in a loose block of calcareous sandstone.

Semmons, W. Copper Pitch-blende and its Associations. *Proc. Liverpool Geol. Soc.* vol. iii. pt. iii. pp. 281–283.

Imported largely into Liverpool from N.W. Mexico, where it is associated with chrysocolla. Analyzed by **W. Hutchings**, who found silica 27·98 p. c., oxide of copper 28·59, oxide of iron 10·94, oxide of manganese 17·53. In chrysocolla associated with it, manganese was absent, and far less iron and silica were present. C. E. R.

Shakespeare, Lieut.-Col. T. D. On Ellipsoidal Nodules of Ironstone. *Proc. Geol. Assoc.* vol. v. no. 3, pp. 121–122. (Abstract.)

From soft blue shale overlying coals near Aberdare.

Silliman, B. On an association of Gold with Scheelite in Idaho. *Amer. Journ.* ser. 3, vol. xiii. pp. 451, 452.

Sipöcz, L. Ueber Miargyrit und Kenngottit. [Miargyrite and Kenngottite.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft ii. pp. 213–220.

Analyses of Miargyrite and Kenngottite from Felsöbanya show that they may be referred to the same formula, $SbAgS_3$ (modern atomic weights). Part of the silver is replaced by lead; and Kenngottite may be regarded as a plumbiferous miargyrite, or a combination of $Sb_2Ag_2S_4$ (Bräunsdorf Miargyrite) and Sb_2PbS_4 (Zinckenite). F. W. R.

——. Skapolith von Rossie, N. York. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. p. 266.

Analysis of scapolite from Rossie.

Sjögren, A. Om Gadolinitens, Orthitens samt med dessa likartade mineraliers förhållande under mikroskopet. [Gadolinite, Orthite, and similar minerals microscopically examined.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 258–262.

Examinations of sections from 20 Scandinavian localities. Ten showed an isotropic, the others an anisotropic refraction.

——. Mineralogiska Notiser. [Mineralogical Notes.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 289–292.

IV. Barytocalcite, a new mineral for Sweden, found at Långban. Analyses given, with description and microscopical notes.

Skey, W. On the Composition of the Silver Ore of Richmond Hill. *Trans. N. Zealand Institute,* vol. ix. pp. 556, 557.

Formula $Sb^2S^3 + 6$ (Pb, Cu, Zn, Fe, Ag, S′). Hardness about 4·5. Sp. gr. 4·317. The name *Richmondite* is proposed for the ore. It contains a low proportion of copper, for which lead appears to be substituted. R. E., Jun.

Smita, Arthur, —. Plagioklas von Soboth in Steiermark. *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft iii. p. 265.

Analysis of plagioclase from Soboth, in Styria.

Smith, Prof. H. J. S. On the Conditions of Perpendicularity in a parallelopipedal System. *Proc. Crystall. Soc.* pt i. pp. 40–48.

Smith, J. L. Examination of American Minerals. No. 6. Description of Columbic Acid Minerals from new localities in the United States, embracing a reclamation for the restoration of the name Columbium to the element now called Niobium. Description and analyses of Columbite, Samarskite, Euxenite and Fergusonite, and the new species Hatchettolite and Rogersite. *Amer. Journn.* ser. 3, vol. xiii. pp. 359–369.

Hatchettolite resembles pyrochlore, but contains 15–16 p. c. of uranium oxide. *Rogersite* is a hydrated columbate of yttrium, &c.

——. Note on the new localities of the Columbic acid minerals, and two new Columbates. *Amer. Journ.* ser. 3, vol. xiii. p. 234.

——. Samarskite of North Carolina. *Amer. Journ.* ser. 3, vol. xiv. p. 71.

Notes the occurrence of thoria in this mineral.

Sorby, H. C. On a New Arrangement for Distinguishing the Axis of Doubly Refracting Substances. *Micr. Journ.* vol. xviii. pp. 209–211.

Instead of the selenite plates which have been used, uses a plate of quartz cut parallel to the principal axis, about 1¼ inch long, and varying in thickness from $\frac{1}{20}$ of an inch at one end to the thinnest possible edge at the other. This plate is mounted in a brass frame like an eye-piece micrometer. Describes the method of using the apparatus. E. T. N.

——. On a simple method for determining the Index of Refraction of small portions of transparent Minerals. *Min. Mag.* No. 4, pp. 97, 98.

——. [Address on the Optical Properties of Minerals.] *Min. Mag.* No. 6, pp. 193–208, plate.

Spezia, G. Sul Colore del Zircone. [Colour of Zircon.] *Atti R. Ac. Turin*, vol. xii. pp. 37–43.

Experiments show that the colour depends on the state of oxidation of the contained iron.

Stelzner, A. Ueber ein eigenthümliches Erzvorkommen bei Miltitz bei Meissen. [Peculiar Occurrence of Ores near Meissen.] *Berg.-hütt. Zeit.* no. 30.

A crystalline limestone, imbedded between clay-slate and hornblende-slate and penetrated by veins of granite, is worked for lime near Miltitz. There have been found in the limestone fragments of calc-spar with pyrites, kupfernickel, arsenide of nickel, cobalt-bloom, argentite, and native silver. F. W. R.

Stoddart, W. W. Notes on the Metals found near Bristol. *Proc. Bristol Nat. Soc.* n. ser. vol. ii. pt. 1, pp. 68–76.

Gives analysis of clay-ironstone from Kingswood, of carbonate of iron from the Avon gorge, of göthite from Sion Hill, of hæmatite from Clifton, Winford, and Ashton. Notes that almost all the Bristol hæmatite has mixed with it a large percentage of silica, probably derived from the Millstone Grit. Gives analyses of Calamine from Harptree, of dolomites from Clevedon and Clifton. Notes the occurrence of malachite at Clevedon, of lead ores and manganese ores in many localities. Gives analysis of Carboniferous Limestone from Walton containing traces of gold and silver. H. B. W.

Stokes, A. W. Canadian Phlogopite. *Sci. Goss.* vol. xiii. pp. 110–112.

Describes the microscopic appearance of phlogopite crystals.

Streeter, E. W. Precious Stones and Gems, their History and distinguishing Characteristics. Pp. 264; 9 pls. (Diamonds, S. African Diamond-mines, Transparent Stones, Gems). 8vo. *London.*

Describes the various precious stones, and gives an account of the S. African diamond-works, and also of the Australian, Brazilian, and Indian. W. W.

Streng, A. Ueber den Chabasit. [Chabasite.] *Ber. oberhess. Ges.* Abstract in *N. Jahrb.* Heft vii. pp. 725–728.

Strüver, G. Studî sui minerali del Lazio. Parte seconda. [Minerals of Latium: pt. 2.] *Atti R. Ac. Linc.* ser. 3, *Mem.* vol. i. pp. 93–111; 2 fols. (marked ser. 2, vol. iv.). Abstract in *Trans.* vol. i. pp. 29, 30.

Continues the description of anhydrous silicates, sodalite, nepheline, anorthite, sanidine, titanite, and idocrase, with special reference to the crystalline form. W. H. D.

——. Die Mineralien Latiums. [The Minerals of Latium.] *Zeitschr. Kryst. Min.* Bd. i. Heft iii. pp. 225–256.

A German version of the first part (see Geological Record for 1876, p. 243). Describes the volcanic minerals of the Alban Hills and the neighbourhood. The first group embraces metalloids, metallic sulphides, and oxides. The second anhydrous silicates. T. W. D.

——. Sulla Sellaite. *Atti R. Ac. Turin.* vol. xii. pp. 59, 60.

Corrects errors in a previous paper on the crystallization of Sellaite.

Thomas, J. W. On the gases enclosed in Lignite-Coal and Mineral-Resin from Bovey Heathfield, Devonshire. *Journ. Chem. Soc.* ser. 2, vol. xxxii. pp. 146–160.

The gases occluded in the Bovey lignites differ from those in ordinary coals of Carboniferous age, but approach to those in the cannel coals. There are, however, great differences; for while in both lignite and cannel the greater portion of the gas is CO_2, it is accompanied in the latter with gases of the paraffin series, but in the former with C_n, H_{2n} gases, and oily matters of the aromatic series, in addition to appreciable quantities of CO. F. W. R.

Tschermak, G. Die Glimmergruppe. Part i. [The Mica Group.] *Zeitschr. Kryst. Min.* Bd. ii. Heft i. pp. 14–50; 2 pls.

The physical properties of the micas are described. Previous investigations have led to the division of the micas into two groups:—1. Containing anomite, phlogopite, lepidolite, muscovite, paragonite, margarite. 2. Meroxene, phlogopite, lepidomelane, zinnwaldite. In 1 the optic axes lie in a plane at right angles to the plane of symmetry: in 2 in a plane parallel to the plane of symmetry. All the micas crystallize in the monosymmetric system. A detailed examination of each species of mica reveals a connexion between its optical properties and chemical constitution, as observed in the bronzites and augites.
T. W. D.

T[schermak]. Künstliche Darstellung der Pseudomorphose von Malachit nach Atacamit. [Artificial Production of Pseudomorphs of Malachite after Atacamite.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. *Min. Mitth.* Heft i. p. 97.

Crystals of atacamite, from Wallaroo, in S. Australia, placed in a solution of bicarbonate of soda, were gradually transformed into malachite. Some of the crystals were 1·2 millimetre thick; but in 4 years the conversion was complete. F. W. R.

Uzielli, Dr. Gustavo. Sulla Mancinite. *Atti R. Ac. Linc.* ser. 3, vol. i. *Trans.* pp. 108, 109.

This trisilicate of zinc, announced as a doubtful species some years since, is to be suppressed. Letters from Descloiseaux, Delesse, and Jacquot are given, bearing on the history, &c. of the name. W. H. D.

——. Sopra la Titanite ed Apatite della Lama dello Spedalaccio. [Titanite and Apatite, N. Italy.] *Atti R. Ac. Linc.* ser. 3, *Mem.* vol. i. pp. 157–161.

Crystallographical description of these minerals occurring in mica-schist.

——. Studî di Cristallografia teorica. [Theoretic Crystallography.] *Atti R. Ac. Linc.* ser. 3, *Mem.* vol. i. pp. 427–480.

Mostly mathematical. Divided into:—1. Hypotheses of integral indices. 2. Hypotheses of superposition or symmetry. 3. Correlation in crystals, of geometric and physical symmetry. 4. Hypotheses of the reducibility of all systems to an Orthogonal System and to the Monometric. 5. On the empirical reduction of all crystalline types to an orthogonal type. Notes are added:—1. On the possible value of an angle being an aliquot part of a circle when the square of its cosine is rational. 2. On the planes of the binary system. 3. Resolution in integers of some Intermediate Equations of the 2nd degree, and application to the monometric system. 4. Theorems of continuous fractions. W. H. D.

Vivian, W. Further notes on the Oxides of Iron, enclosed in Quartz, at Mwyndy, Glamorganshire. *Min. Mag.* No. 4, pp. 117, 118, coloured figs.

Wallace, William. Analyses of Iron-ores, Limestones, Coals, &c. used in the Iron Manufacture in Scotland. *Chem. News*, vol. xxxv. pp. 17, 27, 51, 110, and 238.

A tabular collection of 40 analyses of Blackband and Clayband Ironstones, Hematites, Ochres, and Magnetites, British and foreign.

Ward, J. C. Notes on the occurrence of Chlorite among the Lower Silurian Volcanic Rocks of the English Lake District. *Min. Mag.* No. 4, pp. 119–122.

Websky, —. Ueber die zufälligen Färbungen, welche die verschiedenen Gattungen der Mineralgruppe der Zeolithe zeigen. [Accidental Colours of Zeolites.] *Sitz. Ges. nat. Freunde Berlin*, 15 May, p. 161.

Distinguishes those zeolites which are coloured by mechanical mixture of inorganic matter, such as the red stilbite of Dunbarton with ferric hydrate, and those which are coloured by organic compounds, such as the brown stilbite and heulandite of Arendal coloured with asphalt. Chabasite, stilbite, heulandite, and laumontite, although containing the same elements, have different capacities for receiving organic colouring matters. F. W. R.

Weisbach, Dr. A. Beitrag zur Kenntniss des Miargyrits. [Miargyrite.] *Zeitschr. Kryst. Min.* Bd. ii. Heft i. pp. 55–63, fig. 5.

Fresh measurements of an exceptionally good crystal are given. Kenngottite is shown to be a variety of miargyrite, and grey (*fahl*) rothgültigerz from Andreasberg is identical with it. T. W. D.

——. [*Uranocircite.*] *Jahrb. Berg- Hütt. Sachs.* pp. 48, 49.

Uranocircite, from Falkenstein in Saxon Voigtland, is a uranobarytic phosphate, of the formula $BaU_2P_2O_{12}+8H_2O$.

——. Ueber Bismutosphärit. [Bismuthosphærite.] *Jahrb. Berg- Hütt. Sachs.* pp. 49–51.

On examining specimens of Werner's *Arsenwismuth* from Neustädtel near Schneeberg, it is found to be an anhydrous carbonate of bismuth, Bi_2CO_5. Names it *Bismuthosphærite*, from its spherical structure. F. W. R.

——. Ueber den Roselith. [Roselite.] *Jahrb. Berg- Hütt. Sachs.* pp. 51, 52.

As the analyses of Roselite by Schrauf and Winkler are discordant, the latter re-examined the mineral in as pure a state as can be obtained. His two analyses lead to the following formula :—$(10CaO . 3CoO . 2MgO) 5As_2O_5 + 10H_2O$. F. W. R.

Weisbach, Dr. A. Kobaltspath, ein neues Glied der Kalkspathgruppe. [Cobalt-spar, a new Member of the Calcite Group.] *Jahrb. berg-hütt. Sachs.* pp. 52, 53.

Spheroidal masses of a mineral accompanying Roselite at Schneeberg, in Saxony, were analyzed, and found to be carbonate of cobalt ($CoCO_3$). Names this new mineral *Sphærocobaltite.* F. W. R.

——, Ueber die Krystallform des Walpurgin. [Crystalline Form of Walpurgine.] *N. Jahrb.* Heft i. pp. 1–7, pl. i.; and *Jahrb. berg- hütt. Sachs.* pp. 42–45.

Results of measurement of crystals of Walpurgine. Expresses doubt as to whether this species is monoclinic or triclinic. An appendix settles the question in favour of its triclinic character. F. W. R.

——. Ueber die Silberkiese. [Silver Pyrites.] *N. Jahrb.* Heft ix. pp. 906–913; 2 woodcuts.

Describes silver minerals lately found at Marienberg and at the Himmelsfürst Mine. They stand near to Argentopyrite and Sternbergite, and may be distinguished conveniently as *Argyropyrite.* The empirical formulæ are as follows :—Sternbergite, $Ag^3Fe^6S^9$ ($=AgFe^2S^3$); Argyropyrite, $Ag^3Fe^7S^{11}$; Argentopyrite, $Ag^3Fe^9S^{15}$ ($=AgFe^3S^5$).
F. W. R.

Weiss, —. [Etch-figures.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 208–214; 2 woodcuts.

Describes the figures on etching selenite, and the figures observed in microscope in a thin lamina slightly clouded by warmth in mounting in Canada balsam. E. B. T.

Wiik, F. J. Mineralogiska meddelanden. [Mineralogical Notes. V.] *Œfv. Finska Vet. Soc. Förhandl.* Bd. xix. 19 pp.

19. Crystallographic-optic examination of triclinic felspars. Albite from Somero; grey oligoclase from Sillböle; white oligoclase from Kimito; red labradorite (andesine) from Stansvik; green labradorite from Lojo; green anorthite (lepolite) from Lojo. 20. Epidote-crystal from Heponselkä. 21. Review of Finlandic amphibole and pyroxene species. E. E.

Williams, C. G. Researches on Emeralds and Beryls. Part ii. *Chem. News*, vol. xxxv. pp. 256–258.

Purely chemical. Descriptions of methods of analysis.

Williams, C. P. Some Points in the Treatment of Lead Ores in Missouri. *Trans. Amer. Inst. Min. Eng.* vol. v. pp. 314–329.

States that the ore is almost entirely galenite. The "carbonate ores" contain more or less cerussite, locally known as "Ash Mineral" and "Wood Mineral." The chief associates of the ore are calamine, smithsonite, and sphalerite. Analyses given. R. B. N.

Williams, C. P. Notes on the Method of Preparation of Zinc Oxide. *Trans. Amer. Inst. Min. Eng.* vol. v. pp. 422–426.

The ore occurs in the neighbourhood of Hopewell, Washington County, Missouri. Analysis given.

Winkler, Clemens. Mineraluntersuchungen. [Mineralogical Researches.] *Journ. prakt. Chim.* pp. 86–93.

Recent analysis gives *Roselite* the formula $3RO . As_2O_5 + 2H_2O$. *Sphærocobaltite*, or *cobalt-spar*, from Schneeberg, with Roselite, is $CoCO_3$. *Bismuthosphærite* corresponds with the formula $Bi_2O_3 . CO_2$. *Uranocircite* is found to contain uranium peroxide 56·86; baryta 14·57; phosphoric acid 15·06; and water 13·39 per cent. F. W. R.

Zepharovich, V. v. Galenit von Habach in Salzburg. [Galenite from Habach in Salzburg.] *Zeitschr. Kryst. Min.* Bd. i. Heft i. pp. 155–160; 4 figs.

This variety contains 98·03 p. c. of lead sulphide, and 1·79 of bismuth sulphide. It shows perfect octahedral, and imperfect cubical, cleavage, and many small faces of a twin form not before observed. T. W. D.

——. Thuringit vom Zirmsee in Kärnten. [Thuringite from the Lake of Zirm, in Carinthia.] *Zeitsch. Kryst. Min.* Bd. i. Heft iv. pp. 371–379; 3 woodcuts.

This mineral, resembling chlorite, was found in felspathic veins in gneiss, in forms which are neither crystals nor pseudomorphs. Its formula, $9FeO, 4R_2O_3, 6SiO_2, 10H_2O$ ($Al_2O_3 : Fe_2O_3 = 3 : 1$), differs slightly from that given by Rammelsberg for Thuringite from Schmiedeberg and other localities. In the same drusy cavities occur anatase and white muscovite, of later formation than the thuringite. T. W. D.

——. Krystallographische Wandtafeln für Vorträge über Mineralogie. I. Lief., pls. 1–20. [Crystallographic Diagrams for Mineralogical Lectures. Part I.] *Prague.*

See also:—

Brady, Rev. N. Crystallographic Models and Diagrams: under *Science Conferences*, at end of MISCELLANEOUS.

Daubrée, Prof. A. Artificial Formation of Minerals: under *Science Conferences*, at end of MISCELLANEOUS.

Dellvik, C. A. Lapland Ores: under **Torell**, p. 98.

Gould, —. Analyses of Salt: under **Hunt,** p. 126.

Lewis, J. F. Analyses of American Iron-ores: p. 189.

Meade, R. Quotes analyses of iron-ores: p. 190.

Nicol, J. Crystallography: under *Encyclopædia Britannica,* at end of MISCELLANEOUS.

Szabó, Dr. J. Method of determining Felspars in Rocks: under *Science Conferences,* at end of MISCELLANEOUS.

SUPPLEMENT FOR 1874–1876.

Achiardi, A. d'. Studî sui Minerali della Toscana. [Tuscan Minerals.] *Ann. Univ. Tosc.* t. xv. [1875.]

Ave-Lallemant, —. Estudios microminerológicos. *Act. Ac. Nac. Univ. Cordova,* t. i. [1875.]

Baltzer, B. [Massive Tridymite.] *Vierteljahrsschr. nat. Ges. Zürich,* t. xx. pp. 182–184. [1876.]

Barral, —. Sur la Présence du Fluor et de l'Iode dans les Phosphates. [Presence of Fluorspar and Iodine in Phosphates.] *Bull. Soc. centr. Agric. France,* t. ix. p. 132. [1874.]

Bertrand, E. Sur un nouveau minéral des Pyrénées. [*Friedelite,* new Pyrenean Mineral.] *Compt. Rend.* t. lxxxii. pp. 1167, 1168. [1876.]
Rhombohedral. $H=4{\cdot}75$. $D=3{\cdot}07$. $4MnO . 3SiO_2 . 2HO$.

——. Note sur la forme crystalline du mélinophane. [Crystalline Form of Melinophane.] *Compt. Rend.* t. lxxxiii. p. 711. [1876.]

Besnard, Dr. A. F. Die Mineralogie in ihren neuesten Entdeckungen und Fortschritten im Jahre 1873. *Corr.-Blatt. zool.-min. Ver. Regensburg,* Jahrg. 28, pp. 9–29. [1874.]

——. [The same for 1874.] *Ibid.* Jahrg. 29, pp. 8–24. [1875.]

——. [The same for 1875.] *Ibid.* Jahrg. 30, pp. 9–30. [1876.]
Bibliographic Lists under 7 heads, including Meteorites.

Bodewig, C. Ueber den Glaukophan von Zermatt. [Glaucophane of Zermatt.] *Ann. Phys. Chem.* Bd. clviii. p. 224. [1876.]

——. Ueber die optischen und thermischen Eigenschaften des Datolits. [Optical and Thermal Characters of Datolite.] *Ibid.* p. 230. [1876.]

Bořický, Dr. E. Ueber eine neue konstante Mineralmischung, die derselbe als Parankerit bezeichnete. [*Parankerite*, n. sp.] *Sitz. k. böhm. Ges. Wiss.* 1874, p. 180. See Geological Record for 1876, p. 224.

——. Ueber die Verbreitung des Kali und der Phosphorsäure in den Gesteinen Böhmens. *Arch. nat. Land. Böhm.* Bd. ii. Th. 2. [1874.]

Charlon, E. Note sur la découverte de l'étain oxydé en Toscane. [Oxide of Tin, Tuscany.] *Ann. Mines*, sér. 7, t. ix. pp. 119–122. [1876.]

Chatin, —. Sur la présence de l'Iode dans les Phosphates et les Minerais de fer. [Iodine in Phosphates and Iron Ores.] *Bull. Soc. centr. Agric. France*, sér. 3, t. ix. p. 133. [1874.]

Chevreul, —. Sur la présence du Fluorure de calcium dans les Phosphates. [Presence of Calcic Fluoride in Phosphates.] *Bull. Soc. centr. Agric. France*, t. ix. p. 131. [1874.]

Christofle, P., and H. Bouilhet. Sur le nickel métallique extrait des minerais de la Nouvelle Calédonie. [Nickel of New Caledonia.] *Compt. Rend.* t. lxxxiii. pp. 29–31. [1876.]

Gives the average composition of the mixed ores of nickel as imported to Europe.

Cox, Prof. E. T. [Indianaite.] (*Amer. Assoc.*) *Rev. Sci.* no. 32, p. 440. [1876.]

New Silicate of Alumina.

Dana, E. S. Mineralogical Notes. No. IV. On the association of crystals of Quartz and Calcite in parallel position, as observed on a specimen from the Yellowstone Park. *Amer. Journ.* ser. 3, vol. xii. pp. 448–451. [1876.]

On a piece of chalcedony are rhombohedra of calcite covered again with quartz crystals, which, lying parallel, form a continuous smooth coating on the calcite face. Measurements of the angles of the quartz crystals are given. W. H. D.

Daubrée, Prof. Association du platine natif à des roches à base de péridot; imitation artificielle du platine natif magnétipolaire. [Association of Native Platinum with Peridote Rocks.] *Ann. Mines*, sér. 7, t. ix. pp. 123–143. [1876.] See Geological Record for 1875, p. 236.

——. Note sur un silicate alumineux hydraté déposé par la source thermale de Saint-Honoré (Nièvre) depuis l'époque romaine. [Post-Roman Deposit from a Thermal Spring in Nièvre.] *Compt. Rend.* t. lxxxiii. pp. 421–423. [1876.]

Gives analysis.

Des Cloiseaux, —. On a method of distinguishing the different Feldspars by means of their optical properties. *Amer. Journ.* ser. 3, vol. x. p. 480. [1875.] Translated extract from letter.
Polariscopic notes on orthoclase, microcline, albite, oligoclase, and labradorite.

——. Examen microscopique de l'orthose et des divers feldspaths tricliniques. [Orthoclase, &c. microscopically examined.] *Compt. Rend.* t. lxxxii. pp. 1017–1022. [1876.]
With regard to above 2 papers, see also Geological Record for 1876, p. 334; to note of which memoir add *Compt. Rend.* t. lxxxii. pp. 885–891.

Dölter, Dr. C. Tridymitvorkommen aus dem Hargittastock in Siebenbürgen. [Tridymite in Transylvania.] *Verh. k.-k. geol. Reichs.* pp. 331–334. [1876.]
Notes crystalline form and associated minerals, giving analyses by **Herbich.**

Döll, E. Mineralien von Waldenstein in Kärnthen. [Minerals of Waldenstein, Carinthia.] *Verh. k.-k. geol. Reichs.* pp. 44, 45. [1876.]

——. Markasit nach Sternbergit von Joachimsthal, Pyrit nach Rädelerz von Kapnik. [Marcasite after Sternbergite, Pyrites after Bournonite.] *Verh. k.-k. geol. Reichs.* p. 144. [1876.]

——. Beiträge zur Kenntniss des Mineralvorkommens von Waldenstein in Kärnthen. Pyrit nach Fahlerz. [Pyrites after Fahlerz.] *Verh. k.-k. geol. Reichs.* pp. 171, 172. [1876.]

Domeiko, Ignacio. Mineralogia. Ed. 2. *Santiago.* [1876.]
The following new minerals are described:—*Cuprocalcite,* $(Cu_2O)_2 CO_2 + 2CaCO_3 + H_2O$; *Krönkite,* $CuSO_4 + Na_2SO_4 + 2H_2O$; *Malinowskite* (Raimondi), variety of Tetrahedrite; *Phillipite,* $CuSO_4 + Fe_2 S_3O_{12} + Aq_n$; *Werthemannite* (Raimondi), $Al_2SO_6 + 3H_2O$. Of these, no. 2 is from Bolivia, no. 4 from Chili, the rest from Peru. [From Zezi's list, see Geological Record for 1876, p. 246.] W. H. D.

——. Quinto Apendice al reino mineral de Chile i de las Republicas vecinas publicado en la segunda edicion de la Mineralogia de don I. D. [5th Appendix to the above work.] Pp. 79. 8vo. *Santiago.* [1876.]
Includes descriptions of the above minerals with addition of *Daubréite* (see below). *Huantajayite,* Raimondi, is given as new, though described in 1873 ($20NaCl + AgCl$). [The *Amer. Journ.* notice credits it to Domeiko, and Cuprocalcite to Raimondi.] W. H. D.

——. Daubréite (oxychlorure de bismuth), espèce minérale nouvelle. [*Daubréite,* n. sp.] *Compt. Rend.* t. lxxxii. pp. 922, 923. [1876.]

Gives analysis. Formula $(Bi_2O_3)^4Bi_2Cl_3$. Earthy. Density 6·4. From Constancia, Bolivia.

Domeiko, Ignacio. Examen de minéraux du Chili. [Examination of Chilian Minerals.] *Compt. Rend.* t. lxxxiii. pp. 451, 452. [1876.]
Describes iodochloride of silver and mercury, Hg_2I 54 p. c., AgCl 46 p. c.; and polybasic sulphates of copper.

——. Notice sur divers minéraux récemment découverts au Chili. [New Chilian Minerals.] *Ann. Mines*, sér. 7, t. x. pp. 15–37. [1876.]
Analyses and descriptions are given of 19 minerals from Chili and Bolivia, *Daubréite* (see above) being new.

Exner, F. Bemerkungen zu Sohncke's Aufsatz über Aetzfiguren auf Steinsalzwürfeln. [Etched Figures on Rock-Salt.] *Ann. Phys. Chem.* Bd. clviii. pp. 319, 320. [1876.]

Farsky, F. Mineralogischen Notizen. *Verh. k.-k. geol. Reichs.* pp. 205–209. [1876.]
1. Minerals from the Kosakov basalt (olivine, bronzite, enstatite, diopside, and picotite). Analyses of each are given. 2. Garnets from gneiss and granite of Tabor (Bohemia). Analyses by **J. Novak** and the author. 3. Grammatite of Chejnow (near Tabor). Analysis by **J. Hoffmann.** W. H. D.

Feistmantel, Carl. Malachit auf silurischen Rotheisensteine. [Malachite from Silurian Limonite.] *Lotos*? [1876.]

Frenzel, A. Tellurwismuth und Cosalith. [Tellurium-bismuth and Cosalite.] *Jahrb. k.-k. geol. Reichs.* Bd. xxiii. (for 1873), *Min. Mitth.* p. 293. [1876.]

Friedel, C. Sur des cristaux de fer oxydulé présentant une déformation singulière. [Deformed Crystals of Magnetite.] *Compt. Rend.* t. lxxxiii. pp. 996–998. [1876.]
Hexagonal prisms, with acute rhombohedra at the summit, found in Auvergne. The galena of Beeralstone, Devonshire, is deformed into orthorhombic crystals. W. H. D.

Gamper, J. Mineralogischen Notizen. *Verh. k.-k. geol. Reichs.* pp. 354, 355. [1876.]
Describes a new silicate of alumina from Steinbrück, giving analyses of Halloysite and Allophane. Also describes the form of a twin-crystal of arsenical pyrites from Joachimsthal. W. H. D.

Garnier, J. Le minerai de nickel de la Nouvelle-Calédonie, ou "garniérite." [Garnierite, Ore of Nickel of New Caledonia.] *Compt. Rend.* t. lxxxii. pp. 1454, 1455. [1876.]
Note of associated minerals.

Goldsmith, E. Halloysite from Indiana. *Proc. Ac. Nat. Sci. Philadel.* pp. 140–142. [1876.]
A porcelain clay. Analysis gives $Al_2O_3SiO_2+4H_2O$.

——. On Hexagonite, a new Mineral. *Proc. Ac. Nat. Sci. Philadel.* pp. 160, 161. [1876]. See **Koenig**, p. 265.
From St. Lawrence County, N. Y. Analysis gives
$(CaO . MgO . Na_2O)(SiO_2)_2$.

Gouvenain, — de. Sulfuration du cuivre et du fer par un séjour prolongé dans la source thermale de Bourbon-l'Archambault; observation d'une brèche avec strontiane sulfatée et plomb sulfuré dans la cheminée ascensionelle de cette source. [Breccia with Celestine and Galena near the Thermal Spring of Bourbon l'Archambault.] *Compt. Rend.* t. lxxx. pp. 1297–1300, with observations from **M. Daubrée**, p. 1300. [1875.]

Groth, P. Ueber symmetrische Verwachsungen circularpolarisender Krystalle. [Symmetric Growth of Crystals.] *Ann. Phys. Chem.* Bd. clviii. pp. 214–224. [1876.]

Hahn, Dr. Daniel. Nomenclature in Mineralogy. *Cape Monthly Mag.* vol. xi. no. 91, pp. 50–53. [1875.]

Haushofer, K. Die Constitution der natürlichen Silicate auf Grundlage ihrer geologischen Beziehungen nach den neueren Ansichten der Chemie. [Composition of Natural Silicates.] 8vo. *Brunswick.* [1874.]

Helmhacker, R. Mineralogische Beobachtungen aus dem Böhmerwalde. [Mineralogical Notes on Bohemia.] *Jahrb. k.-k. geol. Reichs.* Bd. xxiii. *Min. Mitth.* pp. 273–288. [1874.]
Notes crystalline form, mode of occurrence, &c. of several minerals.

Heywood, Charles. Carbon and its Compounds. *Trans. Cardiff Nat. Soc.* vol. vi. pp. 26–36. [1875.]
Describes diamond, graphite, &c.

Hilger, Prof. A. Mittheilungen aus dem pharmacologischen Institute und Laboratorium für angewandte Chemie der Universität Erlangen. *Ann. Chem. Pharm.* Bd. clxxi. Heft 6. [1874.]
Gives analyses, by **von Gerichten,** of oligoclase from the Fichtelgebirge, of albite from the Black Forest, and of basalt from Nassau.

Howe, A. B. On Gmelinite from Nova Scotia. *Amer. Journ.* ser. 3, vol. xii. pp. 270–274. [1876.]
No. xlii. of Contributions from the Sheffield Laboratory. Gives analyses of 4 samples.

Issel, Prof. A. Intorno ad un mineral manganesifero del Seneso. [A Manganese Mineral.] *Riv. Sci. Ind.* pp. 8. [1876.]

Jannettaz, Ed. Note sur les anneaux colorés produits par pression dans le gypse, et sur leurs connexions avec les coefficients d'élasticité. [Newtonian Rings in Gypsum.] *Compt. Rend.* t. lxxxii. pp. 839–841. [1876.]
Measurements of the axes of the ellipses.

John, K. Bernstein und Schraufit aus dem Libanon. [Amber and Schraufite from Lebanon.] *Verh. k.-k. geol. Reichs.* pp. 255–257. [1876.]
Analyses, giving the formulæ, $C_{10}H_{16}O$ for amber, and $C_{11}H_{16}O_2$ for Schraufite.

Jones, Prof. T. R. [Precious Stones.] *Fourth Ann. Rep. Wellington Coll. Nat. Sci. Soc.* p. 46. [1874.]
Short abstract (half-page).

Kenngott, A. Lehrbuch der Mineralogie zum Gebrauch beim Unterricht an Schulen und höheren Lehranstalten. [Textbook of Mineralogy.] Ed. 4. Pp. 210. [1876.]

——. Erster Unterricht in der Mineralogie. Pp. 31. *Darmstadt.* [1876.]

Klein, Paul. Ueber Gypskrystalle von Sütel. [Selenite, Sütel.] *Ann. Phys. Chem.* Bd. clviii. p. 611. [1876.]

——. Ueber krystallotektonik des Gypses. [Crystallography of Selenite.] *Ibid.* p. 616.

Klocke, Friedr. Krystallographische Mittheilungen aus dem mineralogischen Museum der Universität Freiburg in Baden. *Ber. nat. Ges. Freiburg,* Bd. vi. Heft 4; 3 pls. [1874.]

Koenig, Dr. G. A. Mineralogical Notes. *Proc. Ac. Nat. Sci. Philadel.* pp. 36, 37, 155, 156. [1876.]
1. On garnet, &c. 2. On Amazon stone and zircon from Pike's Peak, and earthy barite, St. Louis, Mo. Gives analyses of the last two.

——. On Tantalite from Yancey County, North Carolina. *Proc. Acad. Nat. Sci. Philadel.* pp. 39, 40. [1876.]
Describes it, giving analysis.

——. On Pachnolite and Thomsenolite. *Proc. Ac. Nat. Sci. Philadel.* pp. 42–50. [1876.]
Describes mode of analysis, crystallographic form, &c., quoting other analyses for comparison.

——. On Spessartite. *Proc. Ac. Nat. Sci. Philadel.* pp. 53, 54.
From Yancey County, N. C. Gives analysis.

Koenig, Dr. G. A. Mineralogical Notes; Hydrotitanite, a new Mineral. *Proc. Ac. Nat. Sci. Philadel.* pp. 82, 83.

A changed Perowskite; analysis given. Also remarks on changes in garnet.

——. Hexagonite, Goldsmith, a variety of Tremolite. *Proc. Ac. Nat. Sci. Philadel.* pp. 180, 181. See **Goldsmith**, p. 263.

Shows by analysis that this is not specifically distinct.

Krausé, —. [Reichardtite, n. sp.] *Archiv für Pharmacie.* [1874 and 1875.]

Hydrated sulphate of magnesia from Stassfurt.

Krauss, G. [Occurrence and Use of Stassfurtite.] 8vo. *Cöthen.* [1876.]

Lang, V. v. Ueber die Abhängigkeit der Circularpolarisation des Quarzes von der Temperatur. [Dependence of the Polarization of Quartz on Temperature.] *Ann. Phys. Chem.* Bd. clvi. pp. 422–431. [1875.]

Lasaulx, A. von. Ueber ein Hyalith-Vorkommen am Breitenberg bei Striegau. [Hyalite, Striegau.] *Ver. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. i. p. 226. [1874.]

——. Ueber Eisenglanz von Puy-de-Dôme. [Iron-glance, Auvergne.] *Ibid.* p. 254. [1874.]

Laspeyres, Prof. H. Mittheilung über seine vorläufigen krystallographischen Untersuchungen und Messungen an Krystallen von Hamm in Westphalen. [Crystals from Hamm, Westphalia.] *Aix-la-Chapelle.* [1876.]

——. Ueber den Strontianit von Hamm in Westphalen. [Strontianite, Westphalia.] *Nat. Ges. Aachen.* [1876.]

Lebert, —. Ueber die Natur des Bernsteins von Libanon. [Amber of Lebanon.] *Act. Soc. Helv. Sci. Nat.* ann. 59. [1876.]

Leonhard, Prof. Gustav. Die Mineralien Badens nach ihrem Vorkommen. [Minerals of Baden according to their Occurrence.] Ed. 3. Pp. 65. 8vo. *Stuttgart.* [1876.] Price 1 mark 20.

Liebisch, Th. Ueber die mineralogische Zusammensetzung des Gesteins von der Ostseite des Schäferberges bei Gottesberg. [Mineralogy of the Schäferberg.] 52 *Jahresb. Schles. Ges. Kultur,* p. 31. [1875.]

Maderspach, L. Beschreibung der Telekes-Rudobányaer Eisenlagerstätten. [Iron Ores of Telekes-Rudobanya.] *Oesterr. Zeitsch. Berg. Hütt.* no. 7. [1876.]

Mallard, E. Sur le système cristallin de plusieurs substances présentant des anomalies optiques. [Crystalline System of Bodies having Optic Anomalies.] *Compt. Rend.* t. lxxxii. pp. 1063–1065. [1876.]

Crystallography of amphigene, analcime, boracite, senarmontite, and apophyllite.

——. [Same Title, with addition] Théorie des assemblages cristallins. Explication du dimorphism. [Theory of Crystalline Groups. Explanation of Dimorphism.] *Compt. Rend.* t. lxxxii. pp. 1164–1167. [1876.]

Shows how several isomorphous bodies may unite in a group of crystals, or how crystals of the same substances may be aggregated into different forms. W. H. D.

Meunier, S. Nature chimique du sulfure de fer (troilite) contenu dans les fers météoriques. [Troilite of Meteoric Iron.] *Compt. Rend.* t. lxxviii. pp. 763, 764. [1874.]

Troilite has no action with $CuSO_4$, Hg_2Cl_2 or $KHSO_4$, agreeing with pyrrhotine (Fe_7S_8) rather than with iron-pyrites, FeS.

Michel-Lévy, A. Sur un nouvel état globulaire du quartz entièrement crystallisé suivant une seule orientation crystallographique. [New Globular Condition of Quartz entirely crystallized, possessing a single crystalline Cleavage.] *Compt. Rend.* lxxxiii. pp. 1301–1304. [1876.]

Mitchell, W. On the Geometrical Isomorphism of Crystals, and the derivation of all other Forms from the Cubical System. *Journ. Vict. Inst.* [1874.]

Moore, Dr. G. E. Chalcophanite, a new mineral. *Amer. Chem.* July; *Amer. Journ.* ser. 3, vol. x. pp. 391, 392. [1875.]

A mangano-zinc oxide. $\frac{1}{4}MnO\frac{3}{4}ZnO \cdot MnO_2 + H_2O$.

Moser, Dr. K. L. Ein Beitrag zur mineralogischen Kenntniss des Teschener Kreises. [Mineralogy of the Teschen District.] 8vo. *Teschen.* [1876.]

Pisani, F. Notices Minéralogiques. *Compt. Rend.* t. lxxxiii. pp. 166–168. [1876.]

Notes on amesite and euchlorite from Massachusetts, spessartine from Piedmont, and bastite from Elba, with analyses.

——. Sur un sulfo-antimoniure de plomb trouvé à Arnsberg (Westphalie). [Antimoniferous Sulphide of Lead from Westphalia.] *Compt. Rend.* t. lxxxiii. pp. 747–749. [1876.]

Gives analysis. Formula 7PbS, $4SbS_3$.

Radominski, F. Sur un phosphate de cérium renfermant du fluor. [Ceric Phosphate enclosing Fluor-spar.] *Compt. Rend.* t. lxxviii. pp. 764–766. [1874.]

Describes *Korarfveite* (n. sp.) from Korarfvet in Sweden, giving analysis, 94 p. c. being phosphates of cerium, lanthanum, and didymium. W. H. D.

Rath, G. vom. Ueber Hypersthen, Zirkon, Sanidin und Tridymit in Blasenräumen von Trachyt, Mont Dore. [Hypersthene, &c. Mont Dore.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. i. *Sitzungsb.* pp. 102–104. [1874.]

——. Ueber den Foresit. *Ibid.* pp. 105–108. [1874.]

——. Ueber eine Quarzstufe von Schneeberg in Sachsen; Mineralogie des Monzoniberges in Tyrol. [Quartz, Saxony; Minerals, Tyrol.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. i. *Sitzungsb.* pp. 160–164. [1874.]

——. Ueber Kalkspathe von Ahren. [Calcite, Ahren.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. ii. *Sitzungsb.* pp. 40–42. [1875.]

——. Ueber zwei merkwürdige Diamantkrystalle; über die neueste Untersuchung von **Des Cloiseaux** die optischen Eigenschaften der triklinen Feldspathe betreffend; über den Plagioklas im Trachyt der Perlenhardt. [2 Remarkable Diamonds; Optical Peculiarities of Felspars; Plagioclase of the Perlenhardt Trachyte.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. ii. *Sitzungsb.* pp. 57, 58. [1875.]

——. Eine neue Combination des Kalkspaths von Elba; seltsame Fortwachsung eines Kalkspath-Krystalls von Oberstein. [New Arrangement of Calcite, from Elba and Oberstein.] *Ann. Phys. Chem.* Bd. clviii. p. 414. [1876.]

——. Rothgültigerz von Andreasberg. *Ann. Phys. Chem.* Bd. clviii. p. 422. [1876.]

Reboux, —. Sur l'Ambre. [Amber.] *Compt. Rend.* t. lxxxii. pp. 1374, 1375. [1876.]

Gives characteristics distinguishing amber from similar resins, and refers to fossils, &c. enclosed in amber.

Roth, —. Ueber Krystallen des Amazonenstromes. [Crystals of R. Amazon.] 8vo. *Bonn.* [1876.]

Rumpf, Johann. Ueber krystallisirte Magnesite aus den nordöstlichen Alpen. [Crystalline Magnesite of the N.E. Alps.]

Jahrb. k.-k. geol. Reichs. Bd. xxiii. *Min. Mitth.* pp. 263–272. [1874.]

Gives crystalline form and analysis.

Rumpf, Johann. Ueber steirische Magnesit. [Styrian Magnesite.] *Mitth. nat. Ver. Steiermark.* [1876].

Sadebeck, Prof. A. Angewandte Krystallographie (Ausbildung der Krystalle, Zwillingsbildung Krystallotektonik, nebst einem Anhange über Zonenlehre). [Crystallography.] Pp. 284; 23 pls. 8vo. *Berlin.* [1876.]

Describes natural crystals, dealing with hemimorphism, pseudo-symmetry, twins, crystal-growth, &c.

——. Ueber die Theilbarkeit der Krystalle. [Cleavage of Crystals.] *Schrift. nat. Ver. Berlin.* [1876.]

——. Ueber Zwillings-Streifung beim Titaneisen und Eisenglanz. [Twin-streaking in Titaniferous Iron and Iron-glance.] *Ann. Phys. Chem.* Bd. clvi. p. 557. [1875.]

——. Weissbleierz-Zwillinge nach dem Gesetz Zwillingsaxe die Normale einer Fläche von ∞ P 3. [White Zinc-Ore from Aix-la-Chapelle.] *Ibid.* p. 558. [1875.]

——. Ueber einen eigenthümlich ausgebildeten Oligoklas-Krystall von Bodenmais in Bayern. [Oligoclase, Bavaria.] *Ibid.* p. 561. [1875.]

Sadtler, S. P. On the Composition of the Natural Gas from certain Wells in Western Pennsylvania. *Proc. Amer. Phil. Soc.* vol. xvi. no. 97, pp. 206–211. [1876.]

Mode and results of analysis of gas from 4 sources.

Šafarǐk, —. Ueber die chemische Zusammensetzung des Mikrosommites. [Microsommite.] *Sitz. k. böhm. Ges. Wiss.* p. 8. [1874.]

Sainte-Claire Deville, Ch. Sur le feldspath microcline et sur l'andesine. [Microcline and Andesine.] *Compt. Rend.* t. lxxxii. pp. 1015–1017. [1876.]

Scacchi, Arcangelo. Contribuzioni Mineralogiche per servire alla Storia dell' Incendio Vesuviano del' Mese di Aprile, 1872. [Mineralogy of the Vesuvian Eruption of 1872.] Pt. 2. Pp. 69. 4to. *Naples.* [1874.]

Crystallographic and partly chemical description of many species, the following being new:—*Atelite*, $2CuO, CuCl+3H_2O$; *Cryptohalite*, $2NH_4Fl, SiFl_2$; *Chlorocalcite*; *Pseudocotunnite*,? $PbCl, KCl$; *Erythrosiderite*; *Chloromagnesite*; *Chloralluminite*, Al_2Cl_3, xH_2O; *Cupro-magnesite*; *Chlorothionite*, $KCuClSO_4$; *Microsommite*; *Hydrofluorite*, $HFl, SiFl_2$; *Proidonite*, $SiFl_2$. [From *Amer. Journ.* notice, 1875.]

W. H. D.

Scacchi, Arcangelo. Della Cuspidina e del Neocrisolito nuovi Minerali Vesuviani. [Cuspidine and Neochrysolite, new Vesuvian Minerals.] 4to. *Naples.* [1876.]

Schickendantz, —. Apuntes sobre unos sulfatos naturales. [Some Natural Sulphates.] *Act. Ac. Nac. Univ. Córdova,* t. i. [1875.]

Schmidt, Sándor. [Celestine of Romagna.] *Muegyet. Lapok,* köt. i. pp. 109–111. [1876.]

Schrauf, Prof. A. Optisch einaxiger Diamant. [Monaxial Diamond.] *Jahrb. k.-k. geol. Reichs.* Bd. xxiii. (for 1873), *Min. Mitth.* pp. 289, 290. [1874.]

——. Gediegen Kupfer. [Native Copper.] *Ibid.* pp. 290, 291. [1874.]

——. Zur Charakteristik der Mineralspecies Roselits. [Characteristics of Roselite.] *Ibid.* pp. 291–293. [1874.]

——. [*Ihleite,* n. sp.] *Anz. k. Ak. Wiss.* March 1876.

Yellow efflorescence on graphite of Mugran, Bohemia. $Fe_2S_3O_{12} + 12H_2O$.

——. [Analcite.] *Anz. k. Ak. Wiss.* March 1876.

Specimens from Friedeck, Bohemia, show that the species is not isometric; its twinning plane is a dome, with angle of 44° 45′, axial ratio 1 : 0·991. W. H. D.

Seyms, G. H. Relation of Franklinite to the Spinel Group of Minerals. *Amer. Journ.* ser. 3, vol. xii. pp. 210–212; and *Iron,* n. s. vol. viii. p. 589. [1876.]

No. xli. of Contributions from the Sheffield Laboratory, gives analyses of 5 samples, with results very near spinel.

Siegert, —. Ueber eine Antimonglanzfundstätte im sachsischen Granulitgebirge. [Antimony-glance in Saxon Granulite.] *Sitz: nat. Ges. Leipzig,* p. 19. [1874.]

Entered in the GEOLOGICAL RECORD for 1874, p. 228, as by **H. Credner,** who read the paper for the author.

Smith, H. A. Arsenic in Pyrites and various Products. *Mem. Lit. Phil. Soc. Manch.* ser. 3, vol. v. pp. 68–76. [1876.] Abstract in *Proc.* 1871.

Gives analyses of Spanish, Belgian, Westphalian, Norwegian, Irish, Italian, Swedish, Cornish, and Cleveland pyrites, as regards the percentage of arsenic. W. H. D.

Smith, Prof. J. L. Analysis of Aegirite from the Hot Springs, Arkansas. *Amer. Journ.* ser. 3, vol. x. p. 60. [1875.]

——. Two New Minerals. *Proc. Ac. Nat. Sci. Philadel.* p. 87. [1876.]

Note on Daubréite, and on a new hydrated columbate of yttria from N. Carolina.

Smith, Prof. J. L. Nouveau minéral renfermé dans une Météorite: daubrélite. [Daubrélite, a New Meteoric Mineral.] *Compt. Rend.* t. lxxxiii. pp. 74, 75. [1876.]
Protosulphide of chromium, S. 37·62, Cr. 62·38.

——. Sur l'arragonite observée à la surface d'une Météorite. [Aragonite on a Meteorite.] *Compt. Rend.* t. lxxxii. pp. 1505–1507. [1876.]
Derived from the calcareous rocks on which the meteorite fell in the Desert of Mexico. Analysis given.

Sohncke, L. Ueber Aetzfiguren an Steinsalz-Würfeln und die von F. Exner angewandte Methode zur Erzeugung von Lösungsfiguren. [Exner's Method of Etching Rock-salt Crystals.] *Ann. Phys. Chem.* Bd. clvii. pp. 329–335. [1876.]

Stelzner, Alfred. Mineralogische Beobachtungen im Gebiete der argentinischen Republik. Mit chemischen Beiträgen von **Max Siewert.** [Mineralogical Notes on the Argentine Republic.] *Jahrb. k.-k. geol. Reichs.* Bd. xxiii. *Min. Mitth.* pp. 219–254. [1874.]
Notes mode of occurrence, crystalline form, &c. of minerals in the granite of the Cordoba Mts., in the granular limestone, and in the enargite dyke of the Famatina Mts. Describes pseudomorphs of AgCl, Jamesonite, Linarite, Stromeyerite, and pseudomorphs after rock-salt and Clausthalite. W. H. D.

T[schermak, Prof. G.]. Minerale aus der argentinischen Republik. Steinsalz und Glauberite aus den Pendschab. Greenockit von Morawitza. Aurichalcit aus dem Banate. [Argentine Minerals. Rock-salt and Glauberite from the Punjaub. Greenockite of Morawitza. Aurichalcite from the Banat.] *Jahrb. k.-k. geol. Reichs.* Bd. xxiii. *Min. Mitth.* pp. 288, 289. [1874.]
4 short notes.

Weisbach, A. [Rhagite.] *Abh. Gebiete Berg. Hüttenwesens.* [1874.]

Zepharovich, V. v. Bournonit von Waldenstein in Kärnthen; Bournonit von Pribram; rother Vanadinit vom Bleibergbau auf der Obir bei Kappel; Schwefel von Cianciana und Lercara in Sicilien. [Bournonite, Carinthia and Bohemia; Red Vanadinite, Sicilian Sulphur.] *Lotos.* [1876.] (4 separate articles.)

MINERAL WATERS.

Anon. Analysis of Sweet Springs Water, Saline County, Mo. *West. Rev. Sci. Ind.* vol. i. p. 186.

Contains 155 grains of solid matter per gallon—mostly chlorides, of sodium 89·9, of magnesium 22·3, of calcium 14·7.

Batten, E. C. On the Cause of the Heat of the Bath Waters. *Proc. Somerset Archæol. Nat. Hist. Soc.* vol. xxii. pp. 52–60.

Discusses the position and origin of thermal springs. Quotes tables showing that their fixed constituents and temperature have no connexion. Concludes that the heat of the Bath waters is due to their rising from a depth of over 3000 feet. Suggests that in the Mendip Hills quantities of water will be found high enough to account for the volume of water rising at Bath. B. B. W.

Bizio, —. Analisi chimica delle acque termali euganee. [Analysis of the Thermal Waters of the Euganean.] *Atti R. Inst. Ven. Sci.* ser. 5, t. iii. disp. 3.

Boudant, Dr. Les eaux minérales du Mont Dore. [Mineral Waters of Mt. Dore.] 8vo. *Paris.*

Boyd, Dr. J. [Medical Society of Chile.] *Edinburgh Medical Journal.*

Describes the mineral waters of Chillan, Caugciénes, and Apoquindo.

Case, Col. T. S. Editorial Excursion [to Hot Springs, Arkansas]. *West. Rev. Sci. Ind.* vol. i. pp. 254–256.

Quotes analyses by Prof. Larkin (1856) and Prof. D. D. Owens (1858 ?)

Fresenius, Dr. R. Analyse der warmen Quelle zu Assmannshausen. [Analyses of the Warm Springs of Assmannhausen.] *Jahrb. Nassau Ver. Naturk.* Jahrg. xxix. & xxx. pp. 413–431. Entered by mistake in the Geological Record for 1876, p. 247.

Garrigou, Dr. Sur la présence du mercure dans la source du Rocher, à l'établissement du Mont Cornadore (Saint-Nectaire-le-Haut, Puy-de-Dôme). [Mercury in the Rocher Spring at the Mt. Cornadore Establishment.] *Compt. Rend.* t. lxxxiv. pp. 963–965.

Gives full analysis.

Geikie, Prof. Archibald. Notice of a Saline Water from the Volcanic Rocks of Linlithgow. *Proc. R. Soc. Edin.* vol. ix. no. 98 pp. 367–371.

The water from the "whinstone" between Falkirk and Linlithgow is highly saline.

Heriot, Capt. Mackay. The Mineral Waters of Bath. *Proc. Somerset Archæol. Nat. Hist. Soc.* vol. xxii. pp. 47–51.

Gives analysis of the King's Bath Spring. A large proportion of the mineral salts may be derived from the New Red Marls, some from the Lias. The constant thermicity is not due to chemical decomposition. Notes the constancy of chemical composition, as shown in a table of analyses from the year 1806. In 70 years, more than 100,000 tons of solid organic matter was brought up by the springs. B. B. W.

Huseman, —. Chemische Untersuchung zweier Trinkwasserquellen und des Caumasee Wassers bei Flims. [Examination of two Springs of Potable Water, and of that of the Caumasee at Flims.] *Jahresb. nat. Ges. Graub.* Jahrg. xx.

Kedzie, Prof. W. K. The Iola (Kansas) Mineral Well. *West. Rev. Sci. Ind.* vol. i. pp. 257–260.

Gives analysis of the water, which contains 1100 grs. of solid matter per gall.: 971·5 sodium chloride, 60·7 calcium bicarbonate, 25·5 magnesium bicarbonate, &c. Analyses of two of the Saratoga Waters are given for comparison. W. H. D.

Peracca, —. Cenni idrologici sulle acque terme minerali d' Ischia e sui resultate che dal loro uso ne ottennero i militari del R. esercito nell' anno 1876. [Hydrological Notes on the Thermal Mineral Waters of Ischia.] *Giornale di medicina militare,* anno xxv. *Rome.*

Phillips, J. A. The Alkaline and Boracic Lakes of California. *Pop. Sci. Rev.* n. ser. vol. i. pp. 153–168.

Describes Moro and Owen's Lakes. The water of the latter contains 7128·24 grains of solid matter per gallon, chiefly chloride and carbonate of sodium. The lake has no outlet; the water of Owen's River is not apparently saline; the area drained by the river is chiefly composed ot granite, lava, and basalt. The borax-lakes are near Clear Lake. Hot springs are numerous, one of which yields water containing 107·76 grains of bicarbonate of ammonium per gallon, the largest amount of ammoniacal salt observed in any natural water. W. T.

Planchud, E. Recherches sur la formation des eaux sulfureuses naturelles. [Origin of Sulphurous Springs.] *Compt. Rend.* t. lxxxiv. pp. 235–237.

Notes of experiments relating to a sulphurous spring 6 kilom. from Forcalquier in M. Tertiary beds. The sulphuration is here due to fermentation. G. A. L.

Schmidt, Carl. Hydrologische Untersuchungen. *Bull. Ac. Imp. St. Pétersb.* t. xxiv. pp. 176–258, 412–436. (Continued from t. xx.) [1874.]

Quotes analyses of water from various European and Asiatic seas, lakes, and mineral springs. See Geological Record for 1875, p. 412.

Vierthaler, —. Composizione chimica di acque provenienti da' terreni del Carso. [Analysis of the Waters derived from the Carso.] *Boll. Soc. Adr. Trieste,* vol. iii.

See also:—

François, J. Caucasian Mineral Waters: p. 108.

Labat, —. Recoaro Waters, Vicentin: p. 110.

SUPPLEMENT FOR 1874 and 1876.

Carnelley, Thomas. Analysis of one of the Trefriw Mineral Waters. *Mem. Lit. Phil. Soc. Manch.* ser. 3, vol. v. pp. 356–361. [1876.]

The spring occurs in Bala Beds, with ironstone, pyrites, limestone, &c. See GEOLOGICAL RECORD for 1874, p. 259.

Farina, Dr. J. F. La Vallée de la Nervia et ses eaux thermales sulfureuses (Pigna, Castel-Vittorio). Pp. 144. 8vo. *Paris.* [1874.]

Describes, with analyses, mineral waters near Mentone.

Goeppert, —. Ueber die Gründung der Heilquellen von Jastrzemb und Goczalkowitz und Oberschlesiens Reichthum an Steinkohlen. [Spas on the U. Silesian Coal Measures.] 52. *Jahresb. Schles. Ges. Kultur,* p. 40.

Hauer, Carl v. Analyse des Säuerlings bei Ranigsdorf nächst Mährisch Trüban. [Analysis of Acid Water at Teplova, Moravia.] *Verh. k.-k. geol. Reichs.* pp. 355–357. [1876.]

Gives section of borehole, and analysis by **K. John** of the carbonated thermal mineral water.

Huseman, Aug. Die arsenhaltigen Eisensäuerlinge von Val Sinestra bei Sins (Unter Engadin) analysirt, nebst einigen begleitenden Bemerkungen von **E. Killias.** 8vo. *Chur.* [1876.]

John, K. Analyse eines alkalischen Natronsäuerlings von Ločendol bei Rohitsch. [Alkaline Soda-spring.] *Verh. k.-k. geol. Reichs.* pp. 114–116. [1876.]

Analysis by **Dr. Fröhlich** of a water containing in 10000 parts 51 of Na_2CO_3 and 14 of other salts.

——. Die Mineralwässer von Dorna Watra in der Bukowina. [Dorna Watra Mineral Water.] *Verh. k.-k. geol. Reichs.* pp. 209, 210. [1876.] See GEOLOGICAL RECORD for 1875, p. 212 (name wrongly given as **J. Conrad**).

Gives 2 analyses.

La Rouvière, —. [Mineral Waters of Hamman Meskoutine, Algeria.] *Bull. Soc. Linn. Norm.* sér. 2, t. 8, pp. 138–149. [1874.]

The thermal springs occur in a plateau incrusted with travertine.

Temperature 95°–96°·3 C. Analysis shows chlorides, sulphates, and carbonates of soda, potash, lime, magnesia, and strontia. Total solids 1·52 gramme per litre. W. H. D.

Rössler, A. R. Beschaffenheit und geologische Verhältnisse des Sauersee's in Hardin County, Texas. [Sour Lake, Texas.] *Verh. k.-k. geol. Reichs.* pp. 227–229. [1876.]

Describes 6 thermal springs with sulphuric acid, carbonic acid, and petroleum, rising in Miocene rocks containing alum and iron-pyrites.

PALÆONTOLOGY.

1. *VERTEBRATA.*

Sub-Editor Prof. L. C. Miall, F.G.S.

Adams, Prof. A. L. On Gigantic Land-tortoises and a small Freshwater Species from the Ossiferous Caverns of Malta, together with a List of their Fossil Fauna; and a note on Chelonian Remains from the Rock-cavities of Gibraltar. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 177–191, pls. v. & vi.

Remains of the carapace and plastron, vertebral column, pelvic and shoulder-girdle, and limbs indicate a gigantic land-tortoise, *Testudo robusta* (n. sp.). A smaller form is provisionally named *T. Spratti* (n. sp.). *Lutremys europæa* is also identified. A new list of the fauna of the cavern and alluvial deposits is given. The Chelonian remains from Gibraltar consist of an imperfect humerus or femur and radius, which do not admit of certain identification. L. C. M.

——. Observations on Remains of the Mammoth and other Mammals from Northern Spain. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 537–539.

Elephas primigenius, *Bos primigenius* (?), and *Cervus elaphus* (?) are recorded from a cavern or rock-fissure in the valley of Udias, Province of Santander. L. C. M.

——. Observations on the Remains of Mammals found in a Fossil State in Ireland. *Journ. R. Geol. Soc. Ireland*, ser. 2, vol. iv. pt. 4, pp. 246–248.

The conclusions do not agree with those of previous writers. Instead of 4 species of bear only one is distinguished, *Ursus spelæus.* The Mammoth appears to be confined to Cavan and Waterford. The following are the only fossil mammals yet met with in Ireland:—*Equus caballus*, *Cervus megaceros*, *C. tarandus*, *C. elaphus*, *Elephas primigenius*, *Hippopotamus* (?), *Canis lupus*, *C. vulpes*, *Ursus spelæus*, *Lepus variabilis.* The meagreness of this list may be due to climatal or physical causes; but the Irish limestone-caves require more careful exploration. E. T. H.

Adams, Prof. A. L. British Fossil Elephants.—Pt. I. *Pal. Soc.* pp. 1–68, pls. i.–v.

Chiefly occupied with the dentition of *E. antiquus*. The few bones which have been identified are described; and the range of the species in space and time is discussed. L. C. M.

Anon. Ink Photograph of the Fossil *Aetosaurus ferratus*, Fraas. *Proc. Dudley Geol. Soc.* vol. 3, no. 5, pp. 130–133; 2 plates.

Photograph from chromolith of a slab of Keuper Sandstone from near Stuttgart, with 24 specimens of the reptile, map, and view of quarry. Description of series and of specimen. Abstract from **Dr. O. Fraas's** paper (see p. 285). W. H. D.

Atthey, Thomas. Notes on a paper by **R. H. Traquair**, M.D., on the Structure of the Lower Jaw in *Rhizodopsis* and *Rhizodus* . . . . *Annals,* ser. 4, vol. xx. pp. 129, 130.

The bone with teeth described by the author and the late **Albany Hancock** as the *premaxilla* of *Rhizodopsis* is really that bone, and not the dentary part of the mandible to which it is referred by Dr. Traquair. Specimens more recently obtained from Newsham are said to show this particular bone in place in the position of a premaxilla. E. T. N.

——. On *Pteroplax cornuta*, H. & A. *Annals,* ser. 4, vol. xx. pp. 369–377, pls. xii. & xiii.

Two crania described in 1868 have since been more cleared from the matrix; and it is shown that the bone then called postfrontal is divided by sutures into 3 parts—"postfrontal proper, the postorbital, and the squamous." Besides these crania, some ribs and vertebræ, three bones of an extremity, and some scutes, all thought to belong to the same individual, are described. E. T. N.

Barkas, W. J. On the Genus *Ctenodus*, a Fish found in the true Coal Measures of Great Britain Pt. I. Pt. II. On the Microscopic Structure of the Mandibular and Palatal Teeth of *Ctenodus*. Pt. III. On the Vomerine Teeth of *Ctenodus*. Pt. IV. On the Dentary, Articular, and Pterygo-palatine bones of *Ctenodus*. *Journ. R. Soc. N. S. Wales* for 1876, pp. 99–110, 110–115, 115–120, 120–123; 5 plates.

Bassani, Dr. Francesco. Ittiodontoliti del Veneto. [Fossil Fish-teeth of Venetia.] Pp. 40. 8vo. *Padua*. In part also under the title "Nuovi Squalidi Fossili." [New Fossil Squalidæ.] *Atti Soc. Tosc. Sci. Nat.* vol. iii. fasc. i. pp. 77–82, pl. xi.

The following new species are described:—*Ætobatis Meneghinii*, *Myliobatis Ombonii*, and *M. elegans*, Eocene of Belluna and Ronca; *Carcharodon simus*, Miocene of Monte del Becco d'oro, and Nummulitic Eocene of Monte Malo di Schio; *Oxyrhina Zignoi*, Eocene of the Veronese; and *Otodus Lawleyi*, Oligocene marls of the Vicentine. E. T. N.

Beneden, Prof. P. J. van. Note sur un Cachalot nain du crag d'Anvers (*Physeterula Dubusii*). [Cachalot from the Antwerp Crag.] *Bull. Ac. R. Belg.* sér. 2, t. xliv. no. 12, pp. 851–856, plate.

Parts of three individuals have been found. A lower jaw is described in detail, and made the type of *Physeterula Dubusii* (n. sp.), which is closely allied to the Cachalot. Parts of two skulls have also been obtained, as well as some caudal vertebræ, several ribs, and part of a sternum. E. T. N.

——. A new Fossil Bird, *Anas Finschi*, from the Earnscleugh Caves, Otago, N. Zealand. *Trans. N. Zealand Inst.* vol. ix. pp. 599–602, pl. 28.

Abridged from *Ann. Soc. Géol. Belg.* [See GEOLOGICAL RECORD, 1875, p. 272.]

——. Les Thalassothériens de Baltringen (Würtemberg). [Thalassotherids of Baltringen.] *Bull. Ac. R. Belg.* sér. 2, t. xli. pp. 471–495, plate.

Towards the close of Miocene time, the Black Forest extended as far as Vienna, Linz, and Lake Constance. Near the last, at Baltringen in U. Swabia, Pastor Probst, of Essendorf, has collected a great number of mammalian remains of that age: these are described under the following headings:—*Squalodon servatum*, *Amphitheria*, Sirenia, Cetacea (*Platyrhynchus canaliculatus*), *Orcopsis acutidens*, *Delphinus Baltringii*, *D.* sp., *Aulocetus molassicus*. G. A. L.

——. Les Phoques fossiles du bassin d'Anvers. [Fossil Seals of the Antwerp Basin.] *Bull. Ac. R. Belg.* sér. 2, t. xli. pp. 783–802.

The fossil bones lately found at Antwerp, from the Upper and Middle Sands, are so many as to measure together about 200 cubic metres. They are described, the following being new:—*Mesotaria ambigua*, *Callophoca obscura*, *Platyphoca vulgaris*, *Gryphoca similis*, *Phocanella pumila*, *P. minor*, *Monotherium Delognii*, *M. affine*, *M. aberratum*. G. A. L.

Beneden, Prof. P. J. van, and Paul Gervais. Ostéographie des Cétacés vivants et fossiles. [Osteology of Living and Fossil Cetacea.] Part 14, pp. 457–512; 3 pls. 4to. *Paris.*

Platanista is concluded; a second species described as *P. indi*. The genera *Inia*, *Pontoporia* or *Stenodelphis* are noticed, and certain forms apparently belonging to the *Delphinorhynchi*. The genus *Pachyacanthus* is described, and three species referred to it. Forms from N. America are alluded to. E. T. N.

Beyrich, Prof. E. Ueber einen *Pterichthys* von Gerolstein. *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 751–756, tab. 10.

Describes *Pterichthys rhenanus*, n. sp., a shield from Devonians of Gerolstein, allied to that described by Sir P. Egerton in *Q. J. G. S.* 1848. E. B. T

Blake, Rev. J. F. History of the Restoration of Extinct Animals. *Proc. Geol. Assoc.* vol. v. no. 3, pp. 91–103.

Some results of recent researches (in part original) into the correct restoration of Graptolites, Encrinites, Trilobites, *Eurypterus*, Belemnites. Ammonites, Cephalaspids, Labyrinthodonts, *Iguanodon*, *Ichthyosaurus*, *Plesiosaurus*, Pterodactyl, *Archæopteryx*, *Dinornis*, Dodo, *Palæotherium*, W. T.

Boettger, Dr. O. Ueber das kleine *Anthracotherium* aus der Braunkohle von Rott bei Bonn. *Palæontographica*, Bd. xxiv. Lief. 5, pp. 163–173, woodcut.

In the Rott lignite (U. Oligocene) was found in 1859 the skull of an *Anthracotherium*, which was named *Sus breviceps*. The dentition (permanent and milk teeth) is described from the collation of several specimens; and the distinction of the species *A. breviceps* is upheld. E. B. T.

Busk, Prof. George. On the Ancient or Quaternary Fauna of Gibraltar, as exemplified in the Mammalian Remains of the Ossiferous Breccia. *Trans. Zool. Soc.* vol. x. pt. 2, pp. 53–136, pls. 1–27; 5 woodcuts.

Some general remarks on the conditions under which the bone-breccia occurs. The remains of many species of the genera *Ursus*, *Hyæna*, *Felis*, *Canis*, *Equus*, *Rhinoceros*, *Cervus*, *Capra*, *Bos*, *Sus*, *Lepus*, and *Elephas* are described in detail. Concludes that the fauna has purely African affinities. E. T. N.

Calderon, S. On the Fossil Vertebrata hitherto discovered in Spain. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 124–133.

A catalogue with introductory remarks. *Sivatherium* is said to occur in the river-course of Duero, on the strength of an astragalus believed to be identified by Dr. Falconer. *Hyænarctos* is recorded from Alcoy (Gervais). L. C. M.

——. Enumeracion de los Vertebrados Fósiles de España. *An. Soc. Españ. Hist. Nat.* tom. v.; reprinted 1877, pp. 35.

An account of the various genera and species of Vertebrata which have been found fossil in Spain. The genera and species mentioned in the above are again alluded to with fuller references; and 17 additions are made to the list. E. T. N.

Capellini, Prof. G. Balenottere fossili e *Pachyacanthus* dell' Italia meridionale. [Fossil *Balænoptera* and *Pachyacanthus* of S. Italy.] *Atti R. Ac. Linc.* ser. 3, *Mem.* vol. i. pp. 611–629; 3 pls. Abstract in *Trans.* pp. 170, 171.

Describes several bones of *Heterocetus Guiscardii*, n. sp., from U. Messinian (L. Pliocene) of Briatico, and portions of other *Mysticeti* (not new), giving a letter from **Prof. G. Seguenza** on a Mio-pliocene deposit near Messina where Cetacean bones occur. W. H. D.

Capellini, Prof. G. Sulla Balenottera di Mondini (Rorqual de la Mer Adriatique). [*Balænoptera* of Mondini.] *Mem. Ac. Bologna*, ser. 3, t. vii. fasc. 3.

——. Della balena di Taranto, confrontata con quelle della Nuova-Zelanda e con talune fossili del Belgio e della Toscana. [The Tarantine Whale compared with that of New Zealand, and with the Fossil Whales of Belgium and Tuscany.] *Mem. Ac. Bologna*, ser. 3, t. vii. 4to. *Bologna.*

Collet, Rob. De i Norge hidtil fundne fossile Fiske fra de glaciale og postglaciale Aflejringer. [Fossil Glacial and Postglacial Fishes, Norway.] *Nyt Mag. Nat.* Bd. 23, n. 3, pp. 11–40; 9 woodcuts.

Description of 16 species; none new, but some without specific names. The fossils are found at several localities from 1 to 360 feet above the sea-level. They have all been found enclosed by concretions. E. E.

Cope, Prof. E. D. Report upon the Extinct Vertebrata obtained in New Mexico by Parties of the Expedition of 1874. *Rep. U. S. Geogr. Surv. W. of 100th Meridian*, vol. iv. pt. ii. pp. xii, 370, pls. xxii.–lxxxiii. 4to. *Washington.*

A detailed description of the vertebrate fossils of the Mesozoic, Tertiary, and Loup-Fork epochs. Chap. 1 contains an account of the Mesozoic and Tertiary beds of Northern New Mexico. Many genera and species are described, the following being new:—From the Mesozoic, *Dystrophæus viæmalæ*, n. gen.; but it is uncertain to what class it belongs. From the Eocene, *Clastes agnus*, *Trionyx ventricosus*, *Plastomenus serialis*, *Stypolophus hians*, *Creodus incertæ sedis* i. and ii., *Tomitherium tutum*, *Plesiarctomys buccatus*, *Coryphodon obliquus*, *C. lobatus*, and 4 uncertain species, *Orotherium lævii.* From the Loup-Fork beds, *Canis wheelerianus*, an indeterminable species of *Protohippus*, and *Dicroceras tehuanus.* A review of the vertebrate fauna of the Eocene and Loup-Fork epochs is given. E. T. N.

——. On a Carnivorous Dinosaurian from the Dakota Beds of Colorado. *Bull. U. S. Geol. Surv. Terr.* vol. iii. no. 4, pp. 805, 806.

Describes the dentary bone of *Lælaps trihedrodon*, n. sp.

——. A Contribution to the Knowledge of the Ichthyological Fauna of the Green River Shales. *Bull. U. S. Geol. Surv. Terr.* vol. iii. no. 4, pp. 807–819.

Describes the new species:—*Dapedoglossus* (n. gen.) *testis*, *Diplomystus* (n. gen.) *dentatus*, *D. analis*, *D. pectorosus*, *Erismatopterus Endlichi*, *Amphiplaga* (n. gen.) *brachyptera*, *Asineops pauciradiatus*, *Mioplosus* (n. gen.) *abbreviatus*, *M. labracoides*, *M. longus*, *M. Beani*, *Priscacara* (n. gen.) *serrata*, *P. cypha*, and *P. liops.* W. H. D.

——. On the Genus *Erisichthe.* *Bull. U. S. Geol. Surv. Terr.* vol. iii. no. 4, pp. 821–823.

Describes the generic characters of *Erisichthe*, adding the specific description of the new species *E. penetrans* and *E. ziphioides.* No age or locality given. W. H. D.

Cope, Prof. E. D. Descriptions of some Vertebrate Remains from the Fort Union Beds of Montana. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vi. pp. 248–261.

Aublysodon lateralis, Lælaps incrassatus, L. explanatus, L. falculus, Dysganus (n. gen.) *encaustus, D. Haydenianus, D. bicarinatus, D. peiganus, Diclonius* (n. gen.) *pentagonus, D. perangulatus, D. calamarius,* and *Monoclonius* (n. gen.) *crassus* are new species founded upon Dinosaurian teeth. *Paronychodon lacustris* (n. gen. and sp.) is apparently of uncertain position. *Compsemys imbricarius, C. variolosus,* and *Polythorax* (n. gen.) *missuriensis* are new species founded upon Chelonian carapaces. *Hedronchus Sternbergii* (n. gen. and sp.) "has the appearance of the crown of a young tooth." Zoological and anatomical position both apparently unknown. *Ceratodus eruciferus, C. hieroglyphus,* and *Myledaphus* (n. gen.) *bipartitus* are supposed new species of fishes. L. C. M.

——. Cretaceous Vertebrates of the Upper Missouri. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vi. p. 266.

——. On some Extinct Reptiles and Batrachia from the Judith River and Fox Hills Beds [Cretaceous] of Montana. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vi. pp. 340–359.

Lælaps Hazenianus, L. lævifrons, and *Zapsalis abradens* are new species apparently founded on Dinosaurian teeth. *Uronautes cetiformis* (n. gen. and sp.) is a Plesiosaurian, known from vertebræ and portions of limbs and ribs. *Champsosaurus* (n. gen.) *profundus, C. annectens, C. brevicollis,* and *C. vaccinsulensis* are new species (Rhynchocephalian ?) based upon vertebræ. The Amphibia include *Scapherpeton* (n. gen.) *tectum, S. laticolle, S. excisum, S. favosum,* and *Hemitrypus jordanianus.* L. C. M.

——. On the Brain of *Procamelus occidentalis.* *Proc. Amer. Phil. Soc.* vol. xvi. pp. 49–52, pl. i.

Cast of brain-case described and figured.

——. On the Vertebrata of the Bone Bed in Eastern Illinois. *Proc. Amer. Phil. Soc.* vol. xvi. pp. 53–64.

The geological horizon of the bed is believed to be Permian. The fauna will be described more fully. The new species are:—Fishes: *Strigilina* (n. gen.) *linguæformis, Ctenodus fossatus, C. Gurleyanus,* and *Peplorhina arctata.* Reptilia (Rhynchocephalia): *Clepsydrops Vinslovii* and *C. pedunculatus.* L. C. M.

——. On some new or little known Reptiles and Fishes of the Cretaceous No. 3 of Kansas. *Proc. Amer. Phil. Soc.* vol. xvi. pp. 176–181.

The Chelonian *Toxochelys latiremis,* and the Fishes *Ichthyodectes*

goodeanus (n. sp.), *I. acanthicus* (n. sp.), *Oricardinus tortus* (n. gen. and sp.), *Anogmius favirostris* (n. sp.), *A. evolutus*, and *Stratodus oxypogon* are either described for the first time or further illustrated.
L. C. M.

Cope, Prof. E. D. Descriptions of Extinct Vertebrata from the Permian and Triassic Formations of the United States. *Proc. Amer. Phil. Soc.* vol. xvi. pp. 182–193.

The collection comprises:—1. Teeth of new Dinosauria, viz. *Palæoctonus appalachianus* (n. gen.), *P. aulacodus*, and *Clepsysaurus veatlianus*; 2. A Crocodilian (?) tooth, named *Suchoprion cyphodon*; 3. Species of *Belodon*; 4. New Rhynchocephalian vertebræ, viz. *Cricotus Gibsonii* and *C. discophorus*; 5. Amphibian (?) vertebræ, referred to *Lysorophus tricarinatus* (n. gen. and sp.) and *Diplocaulus salamandroides*; 6. A large Labyrinthodont skull, with mandible, vertebræ, and ribs, named *Eryops megacephalus*; 7. Teeth and spines of new Fishes, *Strigilina Gurleiana*, *Ctenodus pusillus*, *Orthacanthus quadriseriatus*, and *Archæobelus* (n. gen.) *vellicatus*. Reasons are given for removing from *Ceratodus* two species (*Vinslovii* and *paucicristatus*) found in the *Clepsydrops* shale; and the genus *Ptyonodus* is formed to receive them.
L. C. M.

——. On Reptilian remains from the Dakota Beds of Colorado. *Proc. Amer. Phil. Soc.* vol. xvi. pp. 193–196.

Teeth of the n. gen. and sp. of Saurians *Caulodon diversidens* and *Tichosteus lucasanus* are described. Parts of the carapace and plastron of a Chelonian, *Compsemys plicatulus* (n. sp.), and vertebræ of the Rhynchocephalian *Clepsydrops limbatus* (n. sp.) also occur. L. C. M.

——. A continuation of Researches among the Batrachia of the Coal Measures of Ohio. *Proc. Amer. Phil. Soc.* vol. xvi. pp. 573–578.

Ichthyacanthus (n. gen.) *ohioensis* is a small Amphibian, known from hinder dorsal and caudal vertebræ and adjacent bones. *I. platypus* is in similar condition, the hind foot being well displayed. *Leptophractus lineolatus* is represented by the central part of a cranium, with teeth; *Tuditanus tabulatus* by a cranium and vertebræ. All the species are new.
L. C. M.

——. On a Dinosaurian from the Trias of Utah. *Proc. Amer. Phil. Soc.* vol. xvi. pp. 579–584.

Dystrophæus viæmalæ (n. gen. and sp.) is indicated by fragments of the limbs.

——. On a new Proboscidean. *Proc. Amer. Phil. Soc.* vol. xvi. p. 584.

A tooth from the Miocene of Texas?, which differs from both the *Mastodon* and *Dinotherium*, is a new genus and species, *Cœnobasileus tremontigerus*.
L. C. M.

Cope, Prof. E. D. On the Brain of *Coryphodon*. *Proc. Amer. Phil. Soc.* vol. xvi. pp. 616–620, pls. i. & ii.

A cast of the brain-case of *C. elephantopus* is described and figured.

——. The Suessonian Fauna in North America. *Amer. Nat.* vol. xi. pp. 95–99.

An account of some of the Vertebrata of the Wahsatch formation of New Mexico, pointing out that this formation may be identified by its fauna with the Suessonian or L. Eocene of France and England. H. A. N.

Coues, Capt. Elliott. Fur-bearing Animals: a Monograph of the North-American Mustelidæ..... *U. S. Geol. Surv. Terr.* pp. xiv, 348; 20 pls.

Quotes Cope's description of fossil *Mustelinæ*, pp. 16–19, and Leidy's description of *Lutra piscinaria*, pp. 323, 324.

Coues, Dr. E., and J. A. Allen. Monographs of North-American Rodentia. *Rep. U. S. Geol. Surv. Terr.* vol. xi.

The fossil species are noticed. Appendix A, a "Synoptical List of the Extinct Rodentia of North America," by **J. A. Allen** (pp. 943–949), gives references to the descriptions of each. Appendix B is a "Bibliography of North American Mammals." W. W.

Crane, Agnes. On Certain Genera of Living Fishes and their Fossil Affinities. *Geol. Mag.* dec. ii. vol. iv. pp. 209–219; Also *Brighton Nat. Hist. Soc.* and *Sci. Goss.* pp. 225–227, 249, 250.

Fossil Affinities of the Dipnoi, pp. 212–214. Distribution and Range of the Piscine Families in Geological Time, with a Table, pp. 214–219.

Dawkins, Prof. W. B. On the Mammal Fauna of the Caves of Cresswell Crags. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 589–611, woodcuts.

The Robin Hood Cave has yielded a tooth of *Machairodus*, and an incised drawing of a horse upon bone, of palæolithic age. The results of the excavation are discussed and tabulated. The supposed human fibula from the Victoria Cave, Settle, is probably ursine. L. C. M.

Dawson, J. W. Lower Carboniferous Fishes of New Brunswick. *Canad. Nat.* n. s. vol. viii. no. 6, pp. 337–340.

This new deposit of fossil fishes, on the property of the Beliveau Albertite and Oil Company on the Petitcodiac River, is low down in the L. Carboniferous series, being the equivalent of the Horton series of Nova Scotia. 5 species were recognized, of which two are new, *Palæoniscus* (*Rhadinichthys*) *modulus* (woodcut) and *P. Jacksoni*. Both are described. R. B. N.

——. Note on a Fossil Seal from the Leda Clay of the Ottawa Valley. *Canad. Nat.* n. s. vol. viii. no. 6, pp. 340–342.

The specimen is from the Post-Pliocene clays of Green's Creek, on the Ottawa; it consists of the left ramus of the lower jaw of a young *Phoca grœnlandica*, containing a canine and 4 molar teeth, with an impression of the fifth. R. B. N.

Deslongchamps, E. E. Le Jura Normand. *Etudes Paléontologiques*, Livr. 1, Monog. 4, pp. iv, 1–33, pls. i., ii., iv., and v.

This work is to include a study of the Vertebrata and Invertebrata of the periods included between the Lower Lias and the appearance of the Cretaceous fauna. This part commences with a geological *résumé* of certain facts regarding the lower beds of the Inferior Oolite Marls, and then, after giving the characters of the *Emydosauria* (de Blainv.) and *Teleosauria*, proceeds to describe in detail certain remains which are referred to *Pelagosaurus Brongniarti* and *P. typus.*—Livr. 1, Monog. 6, pp. 1–6, pl. i. After some remarks upon the upper beds of the Inferior Oolite Marl, specimens are described which are referred to a Teleosaurian, *Corax antiquus, Meristodon* sp.?, and to an unknown fish. Then follows a description of Invertebrate fossils (*see* INVERTEBRATA). E. T. N.

Eckers, A. Zur Kenntniss der quaternären Fauna des Donauthales [Quaternary Fauna of the Danube Valley.] *Archiv Anthrop.* Bd. x. pp. 399–408, pl. xii., 7 woodcuts.

Remarks upon various fossil bones from this valley.

Egerton, Sir P. G. On some new Pycnodonts. *Geol. Mag.* dec. ii. vol. iv. pp. 49–55, pls. iii., iv.

Describes *Cœlodus ellipticus*, Gault, Folkestone; *C. gyrodoides*, Greensand, Lyme Regis; *Pycnodus Bowerbankii* and *P. pachyrhinus*, London Clay, Sheppey. W. H. D.

Etheridge, Robert, Jun. Further Contributions to British Carboniferous Palæontology. *Geol. Mag.* dec. ii. vol. iv. pp. 306–309, pl. xiii.

A new form of fish-tooth, from the Scotch Carboniferous Limestone series, closely resembling *Fissodus bifidus*, is described and named *F. Pattoni*. Two other specimens, also from the Scotch Carboniferous Limestone, are described: one of these, a highly ornamented dorsal spine, is referred to Agassiz's *Oracanthus Milleri*; and the other, a palatal tooth, is regarded as *Psammodus rugosus*, although differing somewhat from the published descriptions. E. T. N.

Filhol, H. Recherches sur les Phosphorites du Quercy; Étude des fossiles qu'on y rencontre et spécialement des Mammifères. [Fauna of Quercy Phosphate-deposits.] *Ann. Sci. Géol.* viii. pp. 1–273, 297–340, pls. 1–26. [Continuation: see GEOLOGICAL RECORD for 1876, p. 253.]

The general results are thus formulated:—1. That there were in U. Eocene times forms uniting characters now dispersed through several groups; 2. That many recent forms seem descended by race-variations from animals living in the U. Eocene; 3. Certain zoological types have not undergone, during the immense interval from the Eocene, any important modification to separate them from some in the phosphatic deposits. 77 species are described, among which the following are new; of some, however, preliminary notices have appeared elsewhere. Among Edentata one species; of Lemurs one, *Necrolemur antiquus.* Carnivora (continued) *Thereutherium* (n. gen.) *thylacodes,* allied to *Thylacinus* and *Dasyurus*; *Cynohyænodon Cayluxi, C. minor, Ælurogale* (n. gen.) *intermedia,* intermediate between Felidæ and Mustelidæ; *Mustela felina, Plesiogale mutabilis, P. gracilis, Plesictis robustus, P. palmidens.* As Pachylemuridæ, or intermediate between Pachyderms and Lemurs: *Adapis parisiensis,* Cuv.,=*Palæolemur Betillei,* Delf., *A. magnus, A. minor.* Under Pachysimiadæ, with affinities between Quadrumana and Pigs, *Cebochœrus crassus.* Among Ungulates: *Protapirus* (n. gen.) *priscus, Eurytherium modicum, E. Quercyi, E. minus, Hyracontherium* (n. gen.) *primævum,* with 7 grinders, allied to *Anoplotherium* and *Hyopotamus*; *Paloplotherium Javalii,* perhaps an Eocene representative of the horse; *Xiphodontherium* (n. gen.) *primævum,* the dentition being i. 3, c. 1, pm. 4, m. 3; *Xiphius secundarum, Plesiomeryx quinquedentatus, Cainotherium elongatum, Dacrytherium Cayluxi, Lophiomeryx Gaudryi, Prodremotherium* (n. gen.) *elongatum,* between *Xiphodon* and *Dremotherium, Gelveus curtus, G. insignis, Dorcatherium Nouleti.* Of Marsupials: *Pervatherium Cayluxi, P. Aymardi, P. gracile, P. Lamandini, P. ambiguum, P. cadurcense.* Of Saurians: *Agama galliæ, Plestiodon cadurcense, Iguana europæa, Palæovaranus Cayluxi, Lacerta mucronata, L. Lamandini.* Of Snakes, *Python cadurcensis.* Batrachians, *Rana plica, Bufo serratus.* The fauna is tabulated, and compared with that of other Tertiary deposits; and the conclusion is arrived at that the phosphatic fauna is an original deposit, of one age, U. Eocene, and not a *remanié* collection from two or more beds. E. B. T.

Filhol, H. Considérations sur la découverte de quelques Mammifères fossiles appartenant à l'époque Eocène supérieure. [U. Eocene Mammals.] *Bull. Soc. Philomat. Paris,* sér. 7, t. i. pp. 51–54.

Describes the lower jaws of *Amphidozotherium Cazluxi* [? *Cayluxi*] and *Neurogymnurus Cayluxi,* both new. Transfers *Dichobune lampichii* to *Metadichobune,* n. gen., and describes the skull of *Acotherulum saturninum,* n. sp. G. B.

Flower, W. H. Note on the Occurrence of *Hyænarctos* in the Red Crag of Suffolk. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 534–536, woodcut.

Describes molar teeth apparently identical with *H. sivalensis.*

Forsyth-Major, C. J. Beiträge zur Geschichte der fossilen Pferde insbesondere Italiens. [Fossil Horses of Italy.] Part I. *Abh. schweiz. pal. Ges.* Bd. iv. pp. 16, tab. i.–iv.

Fraas, Dr. Oscar. *Aëtosaurus ferratus*, Fr. Die gepanzerte Vogel-Echse aus dem Stubensandstein bei Stuttgart. [The Mailed Bird-Lizard from the Trias.] *Jahresh. Ver. Nat. Würt.* Jahr. 33, Heft 3, pp. 22; 3 plates, 3 woodcuts. See **Anon.**, p. 276.

The lizard-like fossil *Aëtosaurus ferratus* was obtained from a sandy bed ("Stubensandstein") of the Middle Keuper at Heslach, near Stuttgart. The specimen consists of a large slab with the remains of 24 individuals, each of which is described separately. A detailed account of the structure of the various parts is given; and from a comparison with the various forms of reptiles, *Aëtosaurus* may be regarded as one of the Ornithoscelida with Lacertilian characters. E. T. N.

Fritsch, Dr. Anton. Zur Fauna der Gaskohle von Zabor bei Schlan, Kroucová bei Renc und Tremosna bei Pilsen, sowie über die Sphærosideritkugeln von Zilov. [Fauna of Bohemian Gas-coal.] *Sitz. k. böhm. Ges. Wiss.*, Jan. 26.

——. Ueber einen neuen Saurier aus den Kalksteinen der Permformation (U. Dyas) aus Braunau in Böhmen. [Permian Reptile from Bohemia.] *Sitz. k. böhm. Ges. Wiss.*, Apr. 27.

Chelidosaurus Vranyi (n. gen. and sp.) is described and figured. The discoveries noticed in these two papers are more fully treated in Fritsch's 'Fauna der Gaskohle u. d. Kalksteine d. Permformation Böhmens,' Bd. i. Heft 1, 1879. L. C. M.

——. Ueber die Wirbelthierfauna in der Vorzeit Böhmens. [Vertebrate Palæontology of Bohemia.] *Sitz. k. böhm. Ges. Wiss.*, May 9.

Gaudry, Prof. Albert. Les enchaînements du Monde Animal dans les temps géologiques. Mammifères Tertiaires. Pp. 293; 312 woodcuts. [Dated 1878, but published 1877.] 8vo. *Paris.* Part extracted, under the title "Les Ruminants et leurs parents," in *Rev. Sci.* t. xiii. pp. 553–567; 67 cuts.

The first part of a work which has for its object the study of the relations of the animal kingdom from the first appearance of life upon the globe until the present day. The Tertiary Mammals which are here treated of present conditions peculiarly favourable for the study of questions relative to evolution.

The Tertiary epoch, from the Eocene to the Pliocene, is divided into 15 stages, each characterized by the appearance of certain genera, the whole being arranged in a tabular form.

The different groups of the Mammalia are treated separately; and, commencing with the earlier forms, the relations of certain genera to those which succeed them are pointed out. Thus in treating of "the ruminants and their progenitors," they are shown to be more recent than, and probably descended from, the Pachyderms; and the gradual development of horns and antlers is traced. In the earlier forms the upper incisors are present. The gradual changes by which the tubercular teeth become modified until the forms of the typical ruminant's teeth are attained are traced by comparing those of *Anthracotherium* with those of *Hyopotamus*, *Lophiomeryx*, *Dorcatherium*, and *Palæochœrus* with *Chœropotamus*, *Rhaagtherium*, *Dicroceras*, and *Cervus*. The gradual simplification of the bones of the feet from pachyderms like *Anthracotherium* to the Sheep and the Gazelle are noticed. A chapter is devoted to each of the great groups, and to the classification of the *Ungulata*. E. T. N.

Gaudry, Prof. Albert. Sur un Hippopotame fossile découvert à Bone (Algérie). [Fossil Hippopotamus, Algeria.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 501–504, pl. xviii. [See *post*, p. 297.]

Describes teeth of *Hippopotamus* (*Hexaprotodon*) *hipponensis*, n. sp. **M. Pomel** adds a note that the conglomerate yielding the teeth is probably Quaternary. W. H. D.

——. Les Reptiles des schistes bitumineux d'Autun. [Reptiles of Autun Carboniferous Slate.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 720–723, pl. xxii.

In *Actinodon Frossardi* the vertebræ are mere plates, but the head is well developed; the limbs are little more than paddles, without power of differential movement. W. H. D.

Gaudry, [Prof. A.], and Count Gaston de Saporta. [Palæontology of the Western Territories.] *Amer. Nat.* vol. xi. pp. 184–187.

Letters on the affinities of Old and New World Vertebrata, and physical analogies in deposition.

Geinitz, Dr. [H. B.?] Pterodactylen. *Sitz. Isis Dresden*, pp. 29, 30.

Gervais, Prof. Paul. De la structure des coquilles calcaires des œufs et des caractères que l'on peut en tirer. [Structure of Calcareous Egg-shells.] *Compt. Rend.* t. lxxxiv. pp. 159–165.

Gives an account of this structure, with especial reference to the determination of huge fossil eggs (?) discovered in the lower deposits of Rognac (Garumnian of Provence). Concludes that they are the eggs of a reptile, allied (so far as regards the egg) to certain Emydo-Saurians, and that if, as there is every reason to suppose, they belong to *Hypselosaurus*, that animal more nearly resembles Chelonians than its bones would have led one to suppose. G. A. L.

——. Enumération de quelques Ossements d'Animaux Vertébrés, recueillis aux environs de Reims par M. Lemoine. Deuxième note. [Vertebrate Fossils from Reims.] *Journ. Zool.* vol. vi. pp. 74–79, woodcuts.

The following are determined:—From the Conglomerate of Cernay: a lower jaw of a mammal allied to the *Arctocyon*; a tarsal bone of *Gastornis*; some reptilian vertebræ, of a new genus (*Simœdosaurus Lemoinei*). From the limestone of Rilly: the tibia of a bird as large as *Gastornis*; and several teeth of a small mammal, *Plesiadapis tricuspidens* (n. gen. and sp.). A rodent allied to the Squirrel from the

Lignites of Ay and Montigny. Fragments of fish have been found at Béru and Jouchery, and the teeth of Crocodiles and *Trionyx vittatus*. E. T. N.

Gervais, Prof. Paul. Remarques ostéologiques au sujet des Pieds des Edentés. [Foot-bones of Edentata.] *Journ. Zool.* t. vi. pp. 79–82, 198–228, pls. ii.–iv.

A general introduction alluding to fossil specimens, followed by descriptions and comparisons of the foot-bones in the different groups of recent and fossil forms. E. T. N.

——. Tortue gigantesque fossile au Brésil. [Gigantic Fossil Tortoise from Brazil.] *Journ. Zool.* t. vi. pp. 283–285, plate.

Certain bones from the Amazon basin are believed to belong to a gigantic tortoise, *Testudo elata*. The bones are a portion of lower jaw, the upper extremity of a radius, part of an ulna, and a fragment of a plastron. E. T. N.

Huxley, Prof. T. H. The Crocodilian remains found in the Elgin Sandstones, with Remarks on the Ichnites of Cummingstone. *Mem. Geol. Surv.* Monograph III. Pp. 58. 8vo. Map and fol. atlas of 16 plates.

I. *Stagonolepis Robertsoni.*—Gives introductory remarks upon the discovery of reptilian remains in the Elgin Sandstones, and upon the age of those sandstones, with an account of various opinions down to 1867, when the Triassic age of the beds and the Crocodilian affinities of the fossils were established. Part of at least 3 individuals have been obtained, the largest measuring 12 to 14 feet in length. Two kinds of *dermal scutes* have been found, some flat, others angulated. Many *vertebræ* (cervical, thoracic, sacral, and caudal) are described, all having slightly biconcave centra. Comparative measurements are given of these vertebræ and those of a *Crocodilus biporcatus* 82 inches long. Mutilated fragments of two skulls have been met with; but from these it is not possible to decide whether *Stagonolepis* follows the type of *Teleosauria* or that of *Belodon*. Teeth preserved in one specimen are seen to have swollen crowns marked off by a constriction from the cylindrical fang. The rami of the mandible appear to have been united by a long symphysis. The bones of the pectoral and pelvic arches are described. *Stagonolepis* is shown to be most nearly allied to *Belodon*, though the skulls are very different.

The osteological characters of Crocodilia and of the sub-orders Parasuchia, Mesosuchia, and Eusuchia are given.

II. *A dentigerous bone* (incertæ sedis).—The bone bearing long teeth, thought in 1858 to be the jaw of *Stagonolepis*, is now shown not to belong to that genus. The specimen is fully described; and it is thought, from the character of the teeth, that it may have belonged to a *Labyrinthodon*, or to a fish like *Rhizodus*. It is named *Dasygnathus longidens*.

III. *The Ichnites of the Cummingstone Sandstones.*—Various slabs of footprints from the Cummingstone Quarries were described in 1858; but as the author is now inclined to modify his interpretation, they are again considered. One slab shows three pairs of right and two pairs of left footprints. The length of the stride is about 12 inches, and the greatest length of the footprint about 3·5 inches. The fore foot seems to have been larger than the hind foot; and probably both had 5 toes connected by webs. On one side of this slab there are two confused marks of similar feet twice as large. Another slab shows a large number of much smaller footprints, apparently made by a herd all travelling in the same direction. The first series of footprints is said to be most like the *Chelichnus ambiguus*, and is named *Chelichnus megacheirus*. The smaller footprints are not named. It is improbable that these tracks are Amphibian, Lacertilian, or Chelonian; but they might have been formed by pentadactyle *Parasuchia* or *Ornithoscelida*.

The **Rev. Dr. George Gordon** gives a short account of the geological structure of the Elgin district. E. T. N.

Huxley, Prof. T. H. The History of Birds. *Proc. R. Inst.* vol. viii. pp. 347, 348.

Refers to the fossil birds *Ichthyornis* and *Hesperornis* from the Cretaceous deposits of the United States, "which differ from all other birds in the possession of teeth, and thus still further diminish the interval between birds and reptiles." R. B. N.

Issel, A. Appunti paleontologici. 2. Cenni sui *Myliobatis* fossili dei terreni terziarii italiani. [Tertiary *Mylobates* of Italy.] *Ann. Mus. Nat. Genova*, vol. x.

The following new sp. described—*Myliobatis ligusticus*, *M. Strobeli*, *M. Bellardii*, *M. granulosus*.

Johnson, Randall. An Approximate List of the Extinct Mammalia of Norfolk. *Trans. Norfolk & Norwich Nat. Soc.* vol. ii. pt. 3, pp. 279–292.

Records 28 species from the Norwich Crag, Forest Bed, and Post-glacial deposits, including some specimens dredged from the North Sea, whose precise geological horizon is unknown. H. B. W.

Kayser, —. [L. Devonian *Ctenacanthus*.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 423, 424.

Notes on a *Ctenacanthus* spine found in the Nereites shales of Thuringia, Hercynian stage.

Kowalewsky, W. Ostéologie des *Gelocus Aymardi*. *Palæontographica*, Bd. xxiv. Lief. 2, pp. 145–160, tab. 21, 22.

Found in the U. Eocene of Central France originally, has now been recognized in the phosphorites of S. France, and at Hordwell, Isle of Wight. No perfect skull is known; the remains are fragments of upper jaws, mandibles, limb-bones, &c. The upper jaw has only 3 premolars, as in the older forms, and no incisors; but there are 4 premolars in the mandible. It belongs to the Paridigitata selenodonta. The limb-bones are described in detail. This is the oldest form with the united scaphocuboid of recent Ruminants, and the oldest paridigitate with a cannon bone. E. B. T.

Lavalle, Emile. Note sur une Tête de *Teleosaurus* trouvée à Bléville. [Head of *Teleosaurus* from Bléville.] *Bull. Soc. Géol. Norm.* t. iii. pp. 52–57, pl. iii.

From Kimmeridge Clay, beneath the *Ostrea deltoïdea* bed. The specimen is imperfect, but has many analogies with *T. cadomensis.* The measurements given are double those of *T. cadomensis.* W. W.

Lavocat, —. Paléontologie. Discussion sur les Chevaux fossiles de l'Amérique du Nord. [Fossil Horses of N. America.] *Mém. Ac. Sci. Toulouse,* sér. 7, t. ix. p. 439.

Lawley, R. Monografia dei Resti Fossili del Genere *Notidanus* rinvenuti nel Pliocene Subapennino Toscano. [Monograph of *Notidani* from the Tuscan Pliocene.] *Atti Soc. Tosc. Sci. Nat.* vol. iii. fasc. 1, pp. 57–76, pls. i–iv.

Appeared separately, in 1875, with a different title: see notice, with list of species (which are new), in the GEOLOGICAL RECORD for 1876, p. 357. W. H. D.

Ludwig, R. Fossile Crocodiliden aus der Tertiärformation des Mainzer Beckens. [Crocodiles of Mayence Basin.] *Palæontographica,* suppl. iii. pts. 4 & 5, pp. 52, pls. 1–16.

Alligator Darwini, n. sp., found in the Oligocene of the Mayence basin, is made to include *Crocodilus Rathi, C. medius,* and *C. Bruchi.* Many remains, being much incrusted with pyrites, were only to be obtained in fragments. The chief parts described are parts of skull and mandible with dentition, atlas, axis, a few neck, dorsal, lumbar, and 2 sacral vertebræ, and some caudal vertebræ, and ribs belonging to the anterior vertebral tracts, the limb-bones, and part of the dermal armour. From the character of the 4th tooth, the fossil is allied to the alligators; from the close proximity thereto of the 3rd tooth, to the *Diplocynodon* of the Auvergne Miocene, and to *Alligator hantoniensis.* The atlas and axis show affinity to the Monitor. It differs from living alligators in the arrangement of plates in the nuchal shield, which is separated from the dorsal instead of being continuous. The fore limb had 5 digits, and the foot only 4. *Crocodilus Ebertsi,* n. sp., from the same beds, differs from its contemporaries by its channelled teeth; it has not so long and narrow a snout as *C. champsoides.* E. B. T.

Lydekker, R. Notices of new or rare Mammals from the Siwaliks. *Rec. Geol. Surv. Ind.* vol. x. pp. 76–83.

A description of mammalian teeth from the Manchbar (Siwalik) rocks of Sind, including the following new species—*Hyopotamus balæindicus,* a new genus of Merycopotamoid, *Anthracotherium punjabiense, Hippopotamodon sivalense, Pseudælurus sivalensis.* F. D.

Lydekker, R. Notices of new and other Vertebrata from Indian Tertiary and Secondary Rocks. *Rec. Geol. Surv. Ind.* vol. x. pp. 30–43.

Besides details as to remains of previously described species, the following new species are named—*Bos acutifrons*, *B. planifrons*, *Bubalus platyceros*, *Sivalhippus Theobaldi*, *Ictitherium sivalense*, *Titanosaurus indicus*, and *Plesiosaurus indicus*. The bearing of the occurrence of the genus *Parasuchus* on the position of the Kota-Maleri beds is discussed. F. D

——. Note on the Genera *Chœromeryx* and *Rhagatherium*. *Rec. Geol. Surv. Ind.* vol. x. p. 225.

Some of the teeth described under the name *Anthracotherium siliotrense*, and referred by M. Pomel to a new genus *Chœromeryx*, are shown to belong to *Rhagatherium*; the specific name *sindiense* is assigned. F. D.

Mansel-Pleydell, J. C. Note on a Gavial Skull from the Cornbrash of Closworth. *Proc. Dorset Field Club*, [vol. i.] pp. 28–32, pl. i.

Describes the skull of *Steneosaurus Stephani*, n. sp.

Marsh, Prof. O. C. Principal Characters of the Coryphodontidæ. *Amer. Journ.* ser. 3, vol. xiv. pp. 81–85, pl. iv.

——. Characters of the Odontornithes, with Notice of a new allied Genus. *Amer. Journ.* ser. 3, vol. xiv. pp. 85–87, pl. v.

Describes *Baptornis advenus*, n. gen. and sp., from a tarso-metatarsal bone, from Cretaceous rocks, W. Kansas.

——. Notice of a new and Gigantic Dinosaur. *Amer. Journ.* ser. 3, vol. xiv. pp. 87, 88.

Describes portions of *Titanosaurus montanus*, n. gen. and sp., from Cretaceous beds of Colorado. An herbivorous reptile, 80 feet long (see below). W. H. D.

——. Notice of some new Vertebrate Fossils. *Amer. Journ.* ser. 3, vol. xiv. pp. 249–256.

Describes the following new species from the Rocky Mts.:—*Moropus* (n. gen.) *distans*, *M. senex* and *Allomys* (n. gen.) *nitens* (figured), Miocene of Oregon; *Moropus elatus*, *Tapiravus* (n. gen.) *rarus*, *Bison ferox*, and *B. Alleni*, Pliocene; *Graculavus* (n. gen.) *lentus* (bird), Cretaceous, Texas; *Diplosaurus* (n. gen.) *felix*, *Nanosaurus* (n. gen.) *agilis*, *N. victor*, and *Apatodon* (n. gen.) *mirus*, Wealden, Colorado; *Crocodilus solaris*, Pliocene, Nebraska; and *Heliobatis* (n. gen.) *radians*, Green-River Beds, Wyoming. *Amynodon* (n. gen.) replaces *Diceratherium*, the Eocene Rhinoceros. W. H. D.

——. Introduction and Succession of Vertebrate Life in America. (*Amer. Assoc.* pp. 57.) *Amer. Journ.* ser. 3, vol. xiv. pp. 337–378.

Traces each order of Vertebrata from its first appearance to Post Pliocene times.

Marsh, Prof. O. C. A new Order of Extinct Reptilia (Stegosauria) from the Jurassic of the Rocky Mountains. *Amer. Journ.* ser. 3, vol. xiv. pp. 513, 514.

Describes *Stegosaurus armatus*, n. gen. and sp., from U. Jurassic.

——. Notice of new Dinosaurian Reptiles from the Jurassic formation. *Amer. Journ.* ser. 3, vol. xiv. pp. 514-516.

The name *Titanosaurus* (pre-occupied) is changed to *Atlantosaurus*; and the beds this fossil comes from are Jurassic and Cretaceous. Describes the new species *Apatosaurus* (n. gen.) *ajax*, *A. grandis*, *Allosaurus* (n. gen.) *fragilis*, and *Nanosaurus rex*, from Atlantosaurus Beds (U. Jurassic), Rocky Mountains. W. H. D.

Newton, E. T. On the Remains of *Hypsodon*, *Portheus*, and *Icthyodectes* from British Cretaceous Strata, with Descriptions of New Species. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 505-523, pl. xxii.

Agassiz described under the name *Hypsodon lewesiensis* fossil fishes from the Chalk of Lewes, now referred to Cope's family Saurodontidæ. Cope suggested that this species was based upon two genuine forms, which required to be studied afresh and compared with his own genera *Portheus* and *Icthyodectes*. This is done in the present paper. *Portheus Mantelli* (n. sp.) is separated from Agassiz's species. *P. Daviesii* (L. Chalk), *P. gaultinus* (Gault), and *Ichthyodectes elegans* (L. Chalk), all new species, are described. L. C. M.

Owen, Prof. Richard. Researches on the Fossil Remains of the Extinct Mammals of Australia; with a Notice of the Extinct Marsupials of England. Pp. xv, 522, frontispiece, &c.; atlas of 131 plates. 4to. *London.*

1. Prefatory notice of British Mesozoic Marsupials, with the following new genera and species—*Amblotherium soricinum*, *A. mustelula*, *Peralestes longirostris*, *Achyrodon nanus*, *A. pusillus*, *Peraspalax talpoides*, *Peramus tenuirostris*, *Leptocladus dubius*, *Bolodon crassidens*, *Triacanthodon serrula*, and the new species *Triconodon ferox*, *T. occisor*, *T. major*, *Plagiaulax Falconeri*, *P. medius*. 2. Fossil Mammals of Australia, with the following new species—*Thylacinus major*, *Phascolomys magnus*, *Protemnodon antæus*. R. E., Jun.

——. On the Rank and Affinities in the Reptilian Class of the Mosasauridæ, Gervais. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 682-715, woodcuts.

Cope's proposed order Pythonomorpha is discussed by the light of the European and American Mosasaurian fossils. Evidence is given that in their double occipital hypapophyses, bifurcate and perforate parietal, and in the presence of a columella, as also in "the composite formation of the suspensory joint of the tympanic, in the type of the tympanic, in the composition of the mandible, and in the structure and attachment

of the teeth," the Mosasauridæ are Lacertian, that they display no distinctive Ophidian characters (which the author cannot trace further back than the Tertiary epoch), and that they are not entitled to rank as a separate order in the Reptilian class, but as a group among Lacertilia of equivalent value with Iguanodontidæ among Dinosauria.
L. C. M.

Owen, Prof. R. British Fossil Reptilia of the Mesozoic Formations. —Pt. III. *Pal. Soc.* pp. 95–97, pls. xxiii., xxiv.

A note upon the carpal spines of *Omosaurus hastiger* from the Kimeridge Clay.

——. On a new Species of *Sthenurus*, with Remarks on the Relation of the Genus to *Dorcopsis*, Müller. *Proc. Zool. Soc.* pt. 2, pp. 352–360, pls. 37, 38.

Describes *S. minor*, the smallest species of its genus, but surpassing in size any existing Kangaroo. Does not admit the identity of the genera *Protemnodon* and *Sthenurus* with *Dendrolagus*, as supposed by Prof. A. Garrod. R. E., Jun.

Probst, Pf. Beiträge zur Kenntniss der fossilen Fische aus der Molasse von Baltringen. [Fish from the Baltringen Molasse.] *Jahresh. Ver. Nat. Württ.* Jahrg. 33, p. 69, pls. i., ii.

Describes and figures the following new species:—1. From teeth, *Raja cavernosa*, *R. rugosa*, *R. strangulata*, *R. grandis*, *R. bicornuta*, *R. rhombidens*, *Pristis pristinus*, *P. angustior*; 2. From tail-spines, *Batis spectabilis*, *B. lineatus*, *B. fluitans*, *B. biserratus*; 3. From scales, *Raja mammillaris*, *R. applanata*, *R. lobata*, and *R. conica*, with 4 previously known species. W. H. D.

Rütimeyer, Prof. L. Die Rinder der Tertiärepoche, nebst Vorstudien zu einer natürlichen Geschichte der Antilopen. [Tertiary Ruminants.] *Abh. schweiz. pal. Ges.* vol. iv. pp. 72; 3 pls.

Russell, J. C. The Giant Birds of New Zealand. *Amer. Nat.* vol. xi. pp. 11–21.

On the living and extinct wingless birds.

——. Concerning Footprints. *Amer. Nat.* vol. xi. pp. 406–417.

Deals with the mode of formation and preservation of the footprints of Vertebrata and Invertebrata, and describes some of the more noteworthy. H. A. N.

Seeley, Prof. H. G. On *Mauisaurus Gardneri*, an Elasmosaurian from the Base of the Gault at Folkestone. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 541–546, pl. xxiii.

A tooth, vertebræ, ribs, the principal bones of the limbs, and parts of the pectoral arch are described. The species is new. A diagram of the divisions of the vertebral column in Plesiosaurs is given. L. C. M.

Seeley, Prof. H. G. On the Vertebral Column and Pelvic Bones of *Pliosaurus Evansi* (Seeley), from the Oxford Clay of St. Neots, in the Woodwardian Museum of the University of Cambridge. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 716–723, woodcuts.

Theobald, W. Description of a new Emydine from the Upper Tertiaries of the Northern Punjâb. *Rec. Geol. Surv. Ind.* vol. x. pp. 43–45.

Two specimens from the U. Tertiaries S. of Jhand afford a specific diagnosis. The new species *Bellia sivalensis* is described; it occurs in the highest beds of the Sivaliks, in the Punjâb. F. D.

Thomson, J. Upon a new Species of *Megalichthys*, one of the Ganoid Fishes. *Trans. Geol. Soc. Glasg.* vol. v. pt. ii. pp. 327–329.

Not named or figured.

Traquair, Prof. R. H. On the Agassizian Genera *Amblypterus*, *Palæoniscus*, *Gyrolepis*, and *Pygopterus*. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 548–578.

The fishes assigned by Agassiz or subsequent writers to the above genera are critically examined, and redistributed as follows:—AMBLYPTERUS, Ag. (restricted): *A. latus*, *Palæoniscus Duvernoyi*, *P. wratislaviensis*, &c. (Saarbrück beds, &c.). RHABDOLEPIS, Troschel: *A. macropterus* (Saarbrück beds, &c.). COSMOPTYCHIUS, Traquair (n. gen.): *A. striatus* (L. Carb.). ELONICHTHYS, Giebel: *A. nemopterus*, *punctatus* (part), *Palæoniscus striolatus*, *P. Robisoni*, *Pygopterus Bucklandi*, &c. (Carb.). GONATODUS, Traq. (n. gen.): *A. punctatus* (part) (Carb.). PALÆONISCUS, Ag. (restricted): *P. Freieslebeni*, *P. magnus*, *P. macropomus*, *P. elegans*, *P. comptus*, *P. longissimus*, *P. macrophthalmus* (Perm.). RHADINICHTHYS, Traq.: *Palæoniscus ornatissimus*, *P. carinatus*, *P. Wardii* (Carb.). PYGOPTERUS, Ag. (restricted): *P. Humboldtii*, *P. mandibularis*, *P. latus* (Perm.) NEMATOPTYCHIUS, Traq.: *Pygop'erus Greenockii*, *P. gracilis* (Carb.). ISCHYPTERUS, Eg. (*Palæoniscus fultus*, *P. Agassizii*, &c.), ACENTROPHORUS, Traq., n. gen. (*Palæoniscus varians*, *P. Abbsii*, *P. altus*, *P. glaphyrus* ?), and DICTYOPYGE, Eg. (*Palæoniscus catopterus*, &c.), are removed from the Palæoniscidæ. GYROLEPIS, Ag., it is proposed to cancel, at least so far as British fossils are concerned. L. C. M.

——. The Ganoid Fishes of the British Carboniferous Formations. *Pal. Soc.* pp. 1–60, pls. i.–vii.

After a general introduction, the Carboniferous Palæoniscidæ are noticed. The structure of the family is treated in detail; and the genera *Cosmoptychius* and *Elonichthys* (part) are described. *E. semistriatus*, *E. caudalis*, and *E. oblongus* are new species. Errata noticed in *Geol. Mag.* dec. ii. vol. iv. p. 240. L. C. M.

Traquair, Prof. R. H. On new and little-known Fossil Fishes from the Edinburgh District.—No. 2. *Proc. R. Soc. Edin.* vol. ix. pp. 275–282.

Re-defines the genus *Elonichthys*, Giebel, and enumerates the species referable to it.

——. On new and little-known Fossil Fishes from the Edinburgh District.—No. 3. *Proc. R. Soc. Edin.* vol. ix. (Appendix) pp. 427–444.

Describes as new *Elonichthys ovatus*, *E.* ? *pectinatus*, *Rhadinichthys* (n. gen.) *ferox*, *R. lepturus*, *R. Geikiei*, *R. brevis*, *R. tenuicauda*. To *Elonichthys* is also referred *Pygopterus Bucklandi*; the type of *Rhadinichthys* is *R.* (*Palæoniscus*) *ornatissimus* (pars); and to the same genus is referred *Palæoniscus carinatus*. The forms are all Carboniferous, either Calciferous Sandstone or Carboniferous Limestone. R. E., Jun.

——. On the Cranial Osteology of *Rhizodopsis*, and on some points in the Structure of *Rhizodus*. *Proc. R. Soc. Edin.* vol. ix. pp. 444, 445.

The cranial structure of *Rhizodopsis* is described, and some points upon which the author differs from previous writers dwelt upon. The lower jaw of *Rhizodus Hibberti* has essentially the same structure as that of *Rhizodopsis*. R. E., Jun.

——. On the Structure of the Lower Jaw in *Rhizodopsis* and *Rhizodus*. *Annals*, vol. xix. ser. 4, pp. 299–305, and vol. xx. p. 224.

The narrow elongated bone of *Rhizodopsis*, regarded by Hancock and Atthey as the premaxilla, is the dentary part of the mandible; the true premaxilla, found in place, is very small, and restricted to the front part of the upper jaw. The lower jaw of *Rhizodus* has a similarly shaped dentary portion; and all the laniary teeth, except the anterior one, were supported upon separate internal dentary ossicles. It is believed that the laniary teeth of *Rhizodopsis* were similarly supported upon separate ossicles; and hence it is that when the dentary element is found separate, only traces of the anterior laniary are seen. The 2nd part is in reply to notes by Mr. Atthey. E. T. N.

Vacek, —. Ueber österreichische Mastodonten und ihre Beziehungen zu den Mastodon-Arten Europas. [Austrian Mastodonts.] *Abh. k.-k. geol. Reichs.* Bd. vii. Heft 4.

Zittel, Prof. K. Bemerkungen über die Schildkröten des lithographischen Schiefers in Bayern. [Turtles of Bavarian Lithographic Limestones.] *Palæontographica*, Bd. xxiv. Lief. 5, pp. 175–184, tab. 27, 28.

From the lithographic beds of Bavaria and Cirin (France) a number of turtles have been described. Starting from results obtained by Rütimeyer, concludes, from examination of these remains, that those named *Eurysternum*, *Acichelys*, *Aplax*, *Palæomedusa*, *Achelonia*, *Eury-*

aspis, *Parachelys*, belong all to one form, the differences being due to age, &c. They are here all referred to *Eurysternum Wagleri*, well-preserved specimens being figured and described. E. B. T.

Zittel, —. Ueber den Fund eines Skeletes von *Archæopteryx* im lithographischen Schiefer von Solenhofen. [Skeleton of *Archæopteryx* in the Solenhofen Slate.] *Sitz. k.-bay. Ak. Wiss.* Heft ii.

See also:—

Cope, E. D. New Cretaceous Fossils, United States: p. 120.

Davis, J. W. New Fish (*Hoplonchus*) from the Coal-Measures: p. 9.

Sauvage, Dr. E. New *Clupea*, Cretaceous, Palestine: under **Lartet**, p. 142.

Stoddart, W. W. New Post-Pliocene Mammals: p. 38.

Trautschold, —. Russian Cretaceous: p. 334.

SUPPLEMENT FOR 1874–1876.

Adams, Prof. A. L. On the Natural History and Geographical Distribution of Living and Extent Bears. *Pop. Sci. Rev.* vol. xiii. p. 250. [1874.]

Anon. Fossil Reptilia of South Africa. Professor Owen on the Ancient Conditions of the Cape. *Cape Monthly Mag.* vol. xiii. no. 74, pp. 117–123. [1876.]

Bassani, Dr. Francesco. Annotazioni sui pesci fossili del calcare eoceno di Monte Bolca. *Atti Soc. Ven.-Trent. Sci. Nat.* vol. v. pp. 23–38. [1876.] (And) Pesci fossili nuovi del calcare eoceno di Monte Bolca. *Atti Soc. Ven.-Trent. Sci. Nat.* vol. v. fasc. 1, pp. 12. [1876.]

In the GEOLOGICAL RECORD for 1876, p. 249, these two papers are confounded as one.

Blackmore, H. P., and E. R. Alston. On Fossil Arvicolidæ. *Proc. Zool. Soc.* pp. 460–471. [1874.]

Reviews what is known of the fossil Arvicolidæ, and their relationship to existing species, giving a list of the species.

Burmeister, Dr. H. Monografia de los Glyptodontes. [Glyptodonts. Conclusion.] *An. Mus. Pub. Buenos Aires*, t. ii. no. 12, p. 355. [1875.]

Busk, Prof. George. Note to the 'Report on the Exploration of Brixham Cave.' (*Phil. Trans.* 1873.) *Proc. R. Soc.* vol. xxiii. pp. 1, 2. [1875.]
Refers to Prof. Owen's remarks on *Lagomys spelæus.*

Capellini, Prof. G. Cetacei fossili dell' Italia meridionale. [Fossil Whales of S. Italy.] *Rend. Ac. Sci. Ist. Bologna.* [1876.]

Cope, Prof. E. D. Supplement to the Extinct Batrachia and Reptilia of North America. I. Catalogue of the Air-breathing Vertebrata from the Coal-Measures of Linton, Ohio. Pp. 18. 4to. *Philadelphia.* [1874.]

——. The Relation of Man to the Tertiary Mammalia. *Penn Monthly*, p. 879. [1875.]

Dawson, J. W. On a Recent Discovery of Carboniferous Batrachians in Nova Scotia. *Amer. Journ.* ser. 3, vol. xii. pp. 440–447. [1876.]
A single stump of *Sigillaria* yielded 13 skeletons belonging to 6 species. *Hylerpeton longidentatum* and *H. curtidentatum* are described as new. W. H. D.

Filhol, H. Sur les Vertébrés fossiles trouvés dans les dépôts de phosphate de chaux du Quercy. [Vertebrates of the Quercy Phosphate-beds.] *Bull. Soc. Philomat. Paris*, sér. 6, t. x. pp. 85–89. [1874.]
Assigns the deposit to the L. Miocene. [U. Eocene in a subsequent paper: see *post*, INVERTEBRATA, p. 329.] Describes the following new species—*Machærodus bidentatus*, *Cynodictis brachyrostris*, *C. Borii*, *C. curvirostris*, *C. incertus* (of complex generic character, and perhaps the ancestor of the dog), *C. intermedius*, var. *viverroides*, *Cynohyænodon* (n. gen.) *Cayluxi*, *Mustela felina*, *Galeryx* (n. gen. of Mustelidæ) *ferox*, *Hyrocodon* (n. gen. of Anoplotheridæ) *primævus*, *Gelaucus curtus*, *G. elongatus*, *G. crassus*, *Pervatherium Aymardi*, *P. Cayluxi*, and *Palæosaurus Cayluxi.* G. B.

——. Sur les Vertébrés fossiles des dépôts de phosphate de chaux du Quercy. [Vertebrata of the Quercy Phosphate-beds.] *Bull. Soc. Philomat. Paris*, sér. 6, t. xi. pp. 16–21. [1874.]
Describes the new species *Adapis magnus*, *Paloplotherium Javali*, *P. Cayluxi*, *Anchilophus Cadurcensis*, *Plesiomeryx Cayluxi*, *Hyænodon Heberti*, *H. compressus*, *H. Cayluxi*, *Cynodictis gracilis*, *C. leptorhynchus*, *C. crassidens*, *C. brevirostris*, and *C. ferox.* G. B.

Filhol, H. Sur les mammifères fossiles des phosphorites du Quercy. [Mammals of the Quercy Phosphorite.] *Bull. Soc. Philomat. Paris*, sér. 6, t. xiii. pp. 15–17. [1876.]

Describes the new species *Gelveus insignis* and *Pseudœlurus ambiguus.*

——. Sur les Reptiles fossiles des phosphorites du Quercy. [Reptiles of the Quercy Phosphorite.] *Bull. Soc. Philomat. Paris*, sér. 6, t. xiii. pp. 27–28. [1876.]

Describes the new species *Bufo serratus* and *Proiguana europeana,* referring also to Ophidian remains.

——. Mammifères fossiles nouveaux des dépôts de phosphates de chaux du Quercy. [New Mammals from the Quercy Phosphate Beds.] *Compt. Rend.* t. lxxxii. pp. 288, 289. [1876.]

Describes *Dacrytherium* (n. gen.) *anthracoides*, *Rutitherium* (n. gen.) *Nouleti*, *Thereutherium* (n. gen.) *thylacoides*, *Amphicyon ambiguus*, *Cynodictis exilis*, and *Didelphys Lamandini*, all new species.

[Some of the species in the above papers by **Filhol** have been described more fully in later papers. See GEOLOGICAL RECORD for 1876, p. 253.] W. H. D.

Flower, Prof. W. H. On Palæontological Evidence of Gradual Modification of Animal Forms. *Proc. Roy. Inst.* vol. vii. pp. 94–104. [1875.]

A detailed account of the order Ungulata, with a plan of a provisional classification.

Gaudry, Prof. A. Sur un Hippopotame à six incisives inférieures trouvé fossile en Algérie. [Hippopotamus with 6 Lower Incisors from Algeria.] *Compt. Rend.* t. lxxxiii. pp. 90–92. [1876.] See above, p. 286.

Glasville, Morel de. Sur la cavité crânienne et la position du trou optique dans le *Steneosaurus Heberti.* [Cranial Cavity and Orbit of *Steneosaurus.*] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 342–347, pls. viii., ix.; and *Compt. Rend.* t. lxxxii. pp. 1068, 1069. [1876.]

Shows that this Oxfordian genus is not a Teleosaur.

Goldenberg, Dr. F. Ueber fossile Thierreste aus dem Steinkohlengebirge Saarbrückens. [Fossils of Saarbrück Coal Measures.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. i. *Corr.-Blatt*, p. 78. [1874.]

Hasse, C. Die fossilen Wirbel. Morphologische Studien aus dem anatomischen Institut zu Breslau. [Fossil Vertebræ.] *Morpholog. Jahrb.* Bd. ii. pp. 449–477, pls. 30, 31. [1876.]

Hensel, —. Unterschiede zwischen *Ursus spelæus* und *U. arctos.* [Distinction between *Ursi.*] *Sitz. Ges. nat. Freunde Berlin,* pp. 48–50. [1876.]

Separates them by the dentition.

Hoernes, Dr. R. Zur Kenntniss des *Anthracotherium dalmatinum,* v. Meyer. [*Anthracotherium dalmatinum.*] *Verh. k.-k. geol. Reichs.* for 1876, pp. 363–366.

Laurance, J. Some Impressions of the Feet of Animals recently found in the New Red Sandstone, near Liverpool. *Trans. Leicester Lit. Phil. Soc.* pt. ii. pp. 41, 42. [1876, read 1838.]

——. Agassiz's Discoveries in Fossil Ichthyology. *Ibid.* pp. 47, 48. [1876, read 1839.]

Marsh, Prof. O. C. Notice of New Tertiary Mammals.—V. *Amer. Journ.* ser. 3, vol. xii. pp. 401–404. [1876.]

From the Eocene of Wyoming and New Mexico the following new genera and species are described—*Eohippus validus, E. pernix, Parahyus vagus, Dromocyon vorax,* and *Dryptodon crassus.* W. H. D.

——. Principal Characters of American Pterodactyls. *Amer. Journ.* ser. 3, vol. xii. pp. 479, 480. [1876.]

Re-describes *Pteranodon* (1876), placing *P. gracilis* in *Nyctisaurus,* n. gen.

Reinhardt, J. De i Brasiliens Knoylehuler fundne *Glyptodon* levninger og en ny, til de gravigrade Edentater hörende Slægt. [Remains of *Glyptodon* found in the Bone-caves of Brazil, and a new Genus of Edentata.] *Vid. Selsk. Skr.*

Sauvage, Dr. H. E. Notes sur les Reptiles fossiles. [Notes on Fossil Reptiles.] *Bull. Soc. Géol. France,* sér. 3, t. iv. pp. 435–442, pls. xi., xii. [1876.] Continuation. See GEOLOGICAL RECORD for 1874, p. 280.

vii. Presence of *Polycotylus* in U. Jurassic and Cretaceous of N. France. Describes the right humerus of *P. suprajurensis,* n. sp., from U. Kimeridgian of Boulogne, and a fragment of that of an allied species from the Gault of the Ardennes. viii. Describes *Iguanodon præcursor,* n. sp., from Kimeridgian of Boulogne. ix. Dinosauria in Gault of N. France. Describes and figures 2 teeth and a vertebra of *Megalosaurus,* and a portion of a femur like the American *Cionodon.* W. H. D.

——. Notice sur un Spathobate du terrain portlandien de Boulogne-sur-Mer. [Portlandian *Spathobatis* from Boulogne.] *Bull. Soc. Acad. Boulogne,* t. ii. p. 94. [1876.]

Seeley, Prof. H. G. Similitudes of the Bones in the Enaliosauria. *Journ. Linn. Soc.* (*Zoology*) vol. xii. pp. 296–329. [1876.]

Treats of the resemblances of Ichthyosaurian and Plesiosaurian bones to those of other animals.

Sirodot, —. Les Eléphants du mont Dol, essai d'organogénie du système des dents mâchelières du Mammoth. [Dentition of the Mammoth.] *Compt. Rend.* t. lxxxii. pp. 734, 822–824, 902–905. [1876.]

Details of development.

——. Les Eléphants du mont Dol. Dentition du Mammoth. Distinction des molaires inférieures et supérieures droites et gauches [Dentition of the Mammoth.] *Compt. Rend.* t. lxxxii. pp. 1065–1068. [1876.]

2. *INVERTEBRATA.*

Sub-Editors Prof. H. A. Nicholson, D.Sc., F.G.S., and R. Etheridge, Jun., F.G.S.

Bellardi, L. I Molluschi dei terreni terziarii del Piemonte e della Liguria. Pt. ii. Gasteropoda (*Pleurotomidæ*). [Tertiary Pleurotomidæ of Piedmont and Liguria.] Pp. 364; 9 pls. 4to. *Turin.*

367 species are described, of which are new:—*Pleurotoma* 25 sp., *Surcula* 16 sp., *Genota proavia*, *G. Craverii*, *G. Bonannii*, *Cryptoconus exacutus*, *Drillia* 44 sp., *Bela Contii*, *Clavatula* 33 sp., *Clinura sabatiorum*, *Pseudotoma* 6 sp., *Rouaultia* (n. gen.) *bicoronata*, *Borsonia Rouaulti*, *Dolichotoma doliolum*, *Oligotoma mirabilis*, *Aphanitoma* 6 sp., *Clathurella* 17 sp., *Homotoma* 9 sp., *Mangelia* 4 sp., *Raphitoma* 18 sp. For the specific names not here given, see Index of New Species.
R. B. N.

Benoist, E. A. Cloisonnaire fossile nouvelle de l'étage miocène inférieur de la Gironde. [New Bivalve from L. Miocene, Gironde.] *Compt. Rend. Soc. Linn. Bordeaux*, t. xxxi. p. xxiii.

Describes *Septaria Henrici*, n. sp.

——, Conchyliologie fossile du Sud-Ouest de la France; Monographie des Tubicoles, Pholadaires et Solenacées fossiles receueillis dans l'étage miocène du Sud-Ouest de la France. [Miocene Conchifera of S.W. France.] *Act. Soc. Linn. Bordeaux*, ser. 4, t. i. pp. 311–332.

26 species are described; and a table showing the distribution of the species in the different stages is appended. The n. sp. are *Clavagella cenonensis*, *C. Brochoni*, *Gastrochæna Hoernesi*, *G. Dufrenoyi*, *Septaria primigenia* (*Henrici* in *Compt. Rend.*, see above), *Teredo Duleaui*, *T. Artiguei*, *Pholas DesMoulinsi*, *P. Brocchi*, *P. Vara*, *Cultellus cenonensis*, *Ensis Basteroti*, and *Solecurtus tenuistriatus*. W. G.

Binney, E. W. A Notice of some Organic Remains from the Schists of the Isle of Man. *Proc. Lit. Phil. Soc. Manch.* vol. xvi. pp. 8; 2 pls.

Records the discovery of some obscure organic remains in L. Silurian slates. One of these is doubtfully referred to *Lingulella Davisii*; and two worm-trails are described as new under the names of *Nemertites*? *monensis*, and *Nereites*? *monensis*. H. A. N.

Bittner, Dr. A. Ueber *Phymatocarcinus speciosus* (Reuss). *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Bd. lxxv. pp. 435–447, plate.

The type was described from a cast. Notes the discovery of fresh specimens in the Leitha-limestone (Miocene) of Gamlitz, in Styria, which supplement our knowledge, and are described in detail. Its living ally is the genus *Daira*; but the claws and footjaws remain unknown, so that it cannot be identified. E. B. T.

Blake, Rev. J. F., and W. H. Hudleston. The Corallian Rocks of England. *Quart. Journ. Geol. Soc.* vol. xxxiii. (see p. 5). Descriptions and Notes on the Fossils, pp. 391–404.

The following n. sp. are described—*Ammonites pseudocordatus*, *A. cawtonensis*, *Chemnitzia langtonensis*, *C. pseudolimbata*, *C. ferruginea*, *Natica marchamensis*, *N. felina*, *Trochus aytonensis*, *Gastrochæna carinata*, *Tancredia disputata*, *Lucina oculus*, *Unicardium plenum*, *Astarte subdepressa*, *Cyprina tancrediformis*, *Cypricardia glabra*, *Protocardium isocardioides*, *Arca lanthanon*, *A. anomala*, *Avicula pteropernoides*, *A. lævis*, *A. ovalis*, Phil., var. *obliqua*, *Gryphæa subgibbosa*, *Glyphea ferruginea*. W. T.

Böttger, Dr. O. Die fossilen Mollusken der Eocänformation auf der Insel Borneo. [Eocene Mollusca of Borneo.] *Jaarb. Mijn. Ned. O.-Ind.* vol. 2, pp. 16–110, plates 1–10; in separate wrapper, "Platen der fossiele mollusken uit der Eoceene vorming van Borneo."

The new species described and figured are the same as those noticed, from the German version, in the GEOLOGICAL RECORD for 1875, p. 299.

——. Ueber die Fauna der Corbicula-Schichten im Mainzer Becken. [Fauna of Corbicula-Beds in Mayence Basin.] *Palæontographica*, Bd. xxiv. pp. 185–219, pl. 29.

The *Corbicula* beds close the L. Miocene: above them are the *Hydrobia* beds, which commence the M. Miocene. During their deposition the climate became cooler than that of the underlying *Cerithium* beds, and the fauna approaches more and more to the European type. Several localities are described, and the fossils set forth in a table showing ranges. The new species are *Gundlachia francofurtana*, *Ancylus Senckenbergianus*. Some varieties of previously described species are also figured. E. B. T.

Brady, H. B. Supplementary Note on the Foraminifera of the Chalk (?) of the New Britain Group. *Geol. Mag.* dec. ii. vol. iv. pp. 534–536.

Gives a list, and notes on some of the species, including 2 n. sp., *Globigerina sacculifera*, *Pulvinulina favus*, and a new variety, *P. Menardii* (var. *tumida*). Cannot be distinguished from a Globigerina-ooze dredged in 1500 to 2500 fathoms in the S. Pacific. R. E., Jun.

Brocchi, P. Note sur un Crustacé fossile du Calcaire Grossier. [Crustacean from the Calc. Grossier.] *Bull. Soc. Philomath. Paris*, sér. 7, t. i. pp. 61–64.

Describes *Palæonotopus Barroisii*.

Brocchi, P. Description de quelques Crustacés fossiles appartenant à la tribu des Raninieus. [Fossil Crustacea, &c.] *Ann. Sci. Géol.* t. viii. art. 2, pp. 1–8, pl. 29.

Fossil *Raninæ* are mostly Tertiary; *Raninella* is Cretaceous. The new species described are *Raninella Trigeri* (A. Milne-Edw. MS.), *R. elongata* (A. M.-Edw.), from the Grès de Maine; *Palæonotopus* (n. g.) *Barroisii*, from the lower part of the Calcaire Grossier, Aisne. E. B. T.

Brochon, H. Observations sur les *Scutella striatula* et *subrotunda.* [Species of *Scutella* found at La Rougeat.] *Compt. Rend. Soc. Linn. Bordeaux*, t. xxxi. pp. xiii, xiv, xviii.

Brodie, Rev. P. B. On Fossil Lepidoptera. *Proc. Warwicksh. Nat. Field Club*, pp. 25–31.

Remarks on Lepidoptera from Eocene, Miocene, &c.

Brongniart, Charles. Note sur les Perforations observées dans deux morceaux de bois fossile. [Perforated Fossil Wood.] *Ann. Soc. Entom. France*, sér. 5, t. vii. pp. 215–220, pl. 7.

Describes burrows in fossil coniferous wood from Carboniferous and Cretaceous rocks, attributable to Coleopterous insects.

——. Note sur une Araneïde fossile des terrains tertiaires d'Aix (Provence). [Tertiary Spider from Aix.] *Ann. Soc. Entom. France*, sér. 5, t. vii. pp. 221–224, pl. 8.

Attoides eresiformis, n. sp., described and figured.

Callaway, Dr. Charles. [New Cambrian Fossils.] *Quart. Journ. Geol. Soc.* vol. xxxiii. (See above, p. 6.)

The new species are—*Platypeltis Croftii*, *Agnostus dux*, *Olenus Salteri*, *O. triarthrus*, *Conophrys* (n. gen.) *salopiensis*, *Lichapyge* (n. gen.) *cuspidata*, *Theca lineata*, *Bellerophon Shinetonensis*, *Lingulella Nicholsoni*, *Obolella sabrinæ*, and *Macrocystella* (n. gen.) *Mariæ*. *Asaphellus* and *Platypeltis* are proposed as subgenera of *Asaphus*. H. A. N.

Carpenter, P. H. On some Points in the Anatomy of *Pentacrinus* and *Rhizocrinus*. *Journ. Anat. Physiol.* vol. xii. pt. 1, pp. 35–53.

Applies deductions from an examination of the living forms of the above to the elucidation of points in certain fossil Crinoids.

——. On the Genus *Actinometra*, Müll., with a Morphological account of a new Species (*A. polymorpha*) from the Philippine Islands. *Journ. Linn. Soc.* vol. xiii. no. 71, pp. 440–457.

Refers to points in the structure of the extinct genus *Solanocrinus* and two fossil species of *Pentacrinus*. Shows that there are many points of difference between *Comaster* and *Solanocrinus*, hitherto considered identical by some. R. E., Jun.

Carter, H. J. On the close Relationship of *Hydractinia*, *Parkeria*, and *Stromatopora*, with Descriptions of new Species of the former, both Recent and Fossil. *Annals*, ser. 4, vol. xix. pp. 44–76, pl. viii.

Treats of the structure of the genera, and brings forward facts in support of the view that the latter two are Hydrozoal, and related to *Hydractinia*. The new species *Hydractinia Vicaryi*, from the Greensand of Haldon Hill, is described: its skeleton is siliceous. H. A. N.

——. Note on the "Tubulations Sableuses" of the Étage Bruxellien in the Environs of Brussels. *Annals*, ser. 4, vol. xix. pp. 382–393, pl. xviii.

Treats of the irregular sandy cylinders found in the Middle Eocene of Belgium, and known as "tubulations sableuses;" concludes that they are Annelidous in their nature and origin, and proposes for them the name of *Broeckia bruxellensis* (n. gen. and sp.). H. A. N.

——. On a Fossil Species of Sarcohexactinellid Sponge allied to *Hyalonema*. *Annals*, ser. 4, vol. xx. pp. 176–178.

Notes the discovery of spicules in the L. Carboniferous rocks of Ayrshire.

Cash, William. Notes on Carboniferous Cephalopoda.—Part i. Recent Cephalopoda. *Proc. Geol. Soc. W. Riding Yorksh.* n. s. pt. iv. pp. 257–279, pl. xi.

Gives the characteristics of each order (including fossil families).

Chabas, F. Notice sur la Découverte d'une Couche abondante de Crinoïdes Fossiles de l'espèce *Pentacrinus*. [Bed of *Pentacrinus*.] Pp. 14; 2 pls. 8vo. *Chalons-sur-Saône.*

Describes a *Pentacrinus* from the Bajocian limestone of St. Julien (Saône-et-Loire).

Chapman, Prof. E. J. On the Probable Nature of the supposed Fossil Tracks known as *Protichnites* and *Climactichnites*. *Canad. Journ.* n. ser. vol. xvi. pp. 486–490.

Gives grounds for the belief that these tracks, from the Potsdam Sandstone, are the impressions of large Fucoids.

Chelloneix, E. [*Belemnitella* from the "Craie Glauconieuse," Blanc Nez.] *Ann. Soc. Géol. Nord*, t. iv. pp. 208, 209.

Unnamed. Near to *B. ultima.*

Ciofalo, S. Su alcune nuove specie fossili del Cretaceo medio di Caltanturo. [New M. Cretaceous Fossils of Caltanturo.] *Ann. Soc. Nat. Modena*, ser. 2, ann. xi.

——. Enumerazione dei principali fossili che si rinvengono nella serie delle rocce stratigrafiche dei dintorni di Termini-Imerese. [List of the principal Fossils of Termini-Imerese.] Pp. 8. 4to. *Catania.*

Clessin, S. Die tertiären Binnenconchylien von Undorf. [Tertiary Shells of Undorf.] *Corr.-Blatt zool.-min. Ver. Regensburg*, 31. Jahrg., pp. 34–41.

The new species described are *Hyalina Boettgeriana*, *H.* sp. near to *crystallina*, *Helix* (*Patula*) *subteres*, *Clausilia* (*Boettgeria*) *Schaefferina*, *Limnæa Undorfensis*, *Planorbis* (*Hippeutis*) *subfontanus*, *P.* (*Gyrorbis*) *angulatus*, *P. Albertanus*, and *Ancylus palustris*. W. W.

——. Vom Pleistocaen zur Gegenwart. Eine conchyliologische Studie. [Pleistocene to Recent. A Conchological Study.] *Corr.-Blatt zool.-min. Ver. Regensburg*, 31. Jahrg., pp. 66–73, 82–84, 98–109, 114–122, 130–139, 162–170.

On the distribution of freshwater and land shells in European Pleistocene and Recent times, giving tables of species and local lists.

Conrad, T. A. Note on a Cirripede of the California Miocene, with Remarks on Fossil Shells. *Proc. Acad. Nat. Sci. Philadel.* ser. 3, vol. vi. pp. 273–275.

Tamiosma gregaria, formerly supposed to be one of the *Rudistæ* by the author, is shown to be identical with *Balanus estrellanus*, and to be a true Balanoid. It differs from the typical species of *Balanus* only in the fact that its basis is filled the entire length with septa. Adds critical notes on *Inoceramus*, *Aphrodina*, *Idonearca*, *Haplothærus*, *Anchura*, and *Etea*. H. A. N.

——. On certain generic names proposed by Zittel, Stoliczka, and Zekeli. *Proc. Acad. Nat. Sci. Philadel.* ser. 3, vol. vii. pp. 22, 23.

Rectifies certain generic names. *Veniella*, Stol., proposed to replace *Venilia*, may be taken for *V. obtruncata*, Stol., which is not a *Venilia*.

——. Notes on Shells. *Proc. Acad. Nat. Sci. Philadel.* ser. 3, vol. vii. pp. 24, 25.

Adds to description of *Cymbophora* (or *Veleda*) *lintea*, U. Cretaceous.

——. Note on the relations of *Balanus estrellanus* of the California Miocene. *Amer. Journ.* ser. 3, vol. xiii. pp. 156, 157. (See above.)

Also remarks on the range of some Mesozoic genera of the Veneridæ.

Cotteau, G. Echinides nouveaux ou peu connus. Art. 13 & 14. Pp. 183–201, pls. 26–28. [1877, undated.] 8vo. *Fontainebleau*.

The following new species, with others already known, are described and figured—*Cyphosoma Douvillei* [1875], *Pleurodiadema nudum* [1875], *P. Gauthieri* [1875], *Echinolampas Orbignyi* [1876], *Nucleolites Chaperi* [1876], *Spatangus Rhodi* [1876], *Psammechinus Fischeri* [1876]. J. P. D.

Dall, W H. Index to the Names which have been applied to the subdivisions of the Class Brachiopoda. *Bull. U. S. Nat. Mus.* no. 8, pp. 88.

Dames, Dr. W. Die Echiniden der vicentinischen und veronesischen Tertiärablagerungen. *Palæontographica*, n. F. i. (xxv.) pp. 1–100, pls. 1–11.

Describes as new species *Cidaris spileccensis*, *C. spinigera*, *Leiocidaris alta*, *Cyphosoma superbum*, *Pyrina ilarioensis*, *Laganum fragile*, *Nucleolites depressus*, *Echinanthus placenta*, *Echinolampas subquadratus*, *Oviclypeus Lorioli*, *Conoclypeus campanæformis*, *Palæopneustes conicus*, *Cyclaster oblongus*, *Linthia bathyolcos*, *Schizaster globulus*, *Metalia eurystoma*, *M. lonigensis*, *Gualteria ægrota*, *Breynia vicentina*, *Euspatangus multituberculatus*, *E. Beyrichi*. An appendix gives their distribution. *Ilarionia* and *Oviclypeus* are new genera. R. E., Jun.

——. [A nut-shaped *Micraster*.] *Zeitschr. deutsch. geol. Ges.* Bd. xxix. pp. 427, 428, woodcut.

In a nut-formed *Micraster breviporus* one of the ambulacra is double, *i. e.* with 4 rows of pores, the effect of an injury causing a protuberance near the genital aperture. E. B. T.

——. Ueber *Hoplolichas* und *Conolichas*, zwei Untergattungen von *Lichas*. [Two new Subgenera of *Lichas*.] *Zeitschr. deutsch. geol. Ges.* Bd. xxix. pp. 793–814, pls. 12–14.

Hoplolichas is characterized by a spine on the middle of the cervical lobe. *Conolichas* has a peculiar elevation of the middle or side lobes of the head; *H. proboscidea*, *C. triconica*, and *C. Schmidtii* are new species. E. B. T.

Davidson, Thomas. Notes on Four Species of Scottish Lower Silurian Brachiopoda. *Geol. Mag.* dec. ii. vol. iv. pp. 13–17, pl. ii.

The new species described are *Siphonotreta scotica* (L. Silurian of Girvan) and *Discina Craigii* (Carboniferous Limestone, Ayrshire).

——. What is a Brachiopod? *Geol. Mag.* dec. ii. vol. iv. pp. 145–155, 199–208, 262–273, pls. vii.–x., and folding table of genera. See Geological Record for 1875, p. 302.

——. On the Species of Brachiopoda that occur in the Inferior Oolite at Bradford Abbas and its Vicinity. *Proc. Dorset Field Club*, [vol. i.] pp. 73–88, pls. i. (*b*), ii., iii.

Describes and figures *Terebratula Stephani* and *Rhynchonella Stephani*, n. sp., besides others.

Dawson, Dr. J. W. Note on Two Palæozoic Crustaceans from Nova Scotia. *Geol. Mag.* dec. ii. vol. iv. pp. 56–58, figs. 1, 2.

Describes and figures *Homalonotus Dawsoni*, from a more perfect specimen than any previously discovered, and, as new, *Anthrapalæmon Hilliana*, from the Coal Measures.

Dawson, Dr. J. W. New Facts relating to *Eozoon Canadense*. *Canad. Nat.* n. ser. vol. viii. no. 5, pp. 282–285. From the *Proc. Amer. Assoc.* for 1876.

Deslongchamps, E. E. Le Jura Normand. Études paléontologiques des divers niveaux Jurassiques de la Normandie. 1 Livr. Monographie 6. Pp. 30; 4 pls. Fol. *Paris* and *Caen*.

The first 6 pages are devoted to Vertebrata (see p. 283); then follow descriptions of the remains of Articulata referable to *Eryma aalensis*, *Stenochirus? mayalis*, n. sp., *Chætopterus incertus*, n. sp., *Tetralysis quadratus*, n. gen. and sp., *Serpula grandis*, *S. torquata*, *S. quadristriata*, *S. limax*, *S. alata*, n. sp., *S. conformis*, *S. prolifera*, *S. subfilaria*, n. sp., *S. ilium*, *S. gordialis*, *S. ramentum*, *S. convoluta*, *S. delphinula*, and *S. lituiformis?* E. T. N.

Dollfus, Gustave. Contributions à la Faune des Marnes blanches supérieures au Gypse. [Fauna of the White Marls above the Gypsum (Paris Basin).] *Bull. Soc. Géol. France*, sér. 3, t. v. pp. 314–317.

The fossils described are from the *Limnæa strigosa* marls, which overlie the Montmartre Gypsum. New Ostracoda are *Cypris amygdala*, *C. nuda*, and *C. tenuistriata*. The new *Chara Tournoueri* is figured. H. A. N.

——. *Valvata disjuncta*, G. Dollf. Espèce nouvelle des Meulières des Environs de Paris. [New Species from the Millstones near Paris.] *Ann. Soc. Mal. Belg.* t. xii., woodcut.

The specimens came from Bessancourt.

——. Terebripora capillacea. Bryozoaire Nouveau du Terrain Dévonien du Cotentin. [New Devonian Bryozoan, Cotentin.] *Bull. Soc. Linn. Norm.* ser. 3, vol. i. pl. i.

Describes and figures *T. capillaris*, and figures associated fossils.

Duncan, Prof. P. M. On the Echinodermata of the Australian Cainozoic (Tertiary) Deposits. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 42–73; pls. iii., iv.

1. Introduction; 2. List of Species; 3. Description of Species; 4. Genera of Echinodermata of the Australian Tertiary and Recent Faunas; 5. Lists of Specific Alliances; 6. Remarks on the Species; and 7. Conclusion. 24 species and two varieties either described or commented upon. New species are *Leiocidaris australiæ*, *Temnechinus lineatus*, *Arachnoides elongatus*, *A. Loveni*, *Rhynchopygus dysasteroides*, *Echinobrissus australiæ*, *Holaster australiæ*, *Maretia anomala*, *Eupatagus rotundus*, *E. Laubei*, *Lovenia Forbesi* var. *minor*, *Megalaster* (n. gen.) *compressus*. Shows the identity of the genera *Lovenia* and *Hemipatagus*. R. E., Jun.

——. On the Salenidæ, Wright.—Part II. Observations on the

Morphology of Recent *Saleniæ*, and Description of a New Species. *Annals*, ser. 4, vol. xx. pp. 245–257, pl. vii.

Concerned principally with recent forms; but contains much bearing upon the structure of the fossil Salenidæ.

Duns, Rev. Prof. On an unnamed Palæozoic Annelide. *Proc. R. Soc. Edinb.* vol. ix. no. 98, pp. 352–359, plate iv.

Describes *Cymaderma* from the Carboniferous strata of the Valley of the Ribble, near Settle. It is contrasted with the tracks made by various crustaceans, mollusks, &c., and many points brought forward in support of the reference to the Annelida. R. E., Jun.

Etheridge, R., Jun. On the Occurrence of a Macrurous Decapod (*Anthrapalæmon? Woodwardi*, sp. nov.) in the Red Sandstone, or Lowest Group, of the Carboniferous Formation in the south-east of Scotland. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 863–877, pl. xxvii.

Gives an outline of the bibliography of the Palæozoic Malacostracous Crustacea. The new species is doubtfully referred to *Anthrapalæmon*; and extends the range of the Macrura to a lower horizon than hitherto known in Britain. H. A. N.

——. On the Remains of a large Crustacean, probably indicative of a new Species of *Eurypterus* or allied genus (*Eurypterus? Stevensoni*), from the Lower Carboniferous (Cementstone Group) of Berwickshire. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 223–228; 2 figs.

E.? Stevensoni is founded upon fragmentary remains from the L. Carboniferous rocks of the neighbourhood of Dunse, Berwickshire. The specimens indicate a species much larger than *E. Scouleri.* H. A. N.

——. Further Contributions to British Carboniferous Palæontology. *Geol. Mag.* dec. ii. vol. iv. pp. 242–251, pl. xii.

Gives critical observations on *Pecten (Amusium?) Sowerbii*, *Aviculopecten papyraceus*, *Anthracomya Phillipsii*, *Capulus neritoides* (n. var. *Simpsoni*), and *Dentalium inornatum*. As new species are described *Anthracomya scotica*, *Sanguinolites? abdenensis*, and *Orthoceras Brownianum.* H. A. N.

——. Palæontological Notes. *Geol. Mag.* dec. ii. vol. iv. pp. 318–320.

Critical observations on *Spirorbis ambiguus*, and on a variety of *Spirorbis carbonarius*, with a description of some peculiar borings in the shell of *Chonetes Laguessiana*, and of certain minute microscopic bodies found in the Scotch Carboniferous rocks, and apparently referable to the Polyzoan genus *Hippothoa.* H. A. N.

——. Notes on Carboniferous Polyzoa. *Annals*, ser. 4, vol. xx. pp. 30–37, pl. ii. A.

Describes a new variety (*scotica*) of *Fenestella arctica*, defines and criticises *Glauconome*, especially with reference to *Acanthocladia*, and describes *G. elegantula* as new; shows that *Thamniscus pustulata* is identical with *T. Rankini*, and concludes with observations upon the genus *Rhombopora*. The new forms are from Scotch Carboniferous rocks. H. A. N.

Etheridge, R., Jun. A Synopsis of the known Species of Australian Tertiary Polyzoa. Pp. 15. 8vo. *Sydney.*

Gives a bibliography, and reference list of the described forms, with localities, &c.

Evans, C. [Forms of *Micraster* in the Chalk.] See above, p. 11.

Describes and figures *M. cor-anguinum*, *M. cor-testudinarium*, and *M. cor-bovis*, and points out their value in the classification of the Chalk.

Favre, Ernest. La Zone à *Ammonites acanthicus* dans les Alpes de la Suisse et de la Savoie. [Alpine Corallian.] *Abh. schweiz. pal. Ges.* Bd. iv. pp. 113, tab. i.–ix.

The new species described are *Oppelia pseudoflexuosus*, *Perisphinctes Freyssineti*, *Ammonites Basilicæ*, *Perisphinctes Heimi*, *Aspidoceras contemporaneum*. Description of sections and tables of ranges in each locality follow. E. B. T.

Feistmantel, O. On the occurrence of the Cretaceous genus *Omphalia* near Namcho Lake, Tibet. *Rec. Geol. Surv. Ind.* vol. x. pp. 21–25, plate.

Reviews the usage of the name *Omphalia*, and describes *O. Trotteri*, n. sp.

——. Note on "Eryon comp. Barrovensis," M'Coy, from the Gripermatur group near Madras. *Rec. Geol. Surv. Ind.* vol. x. pp. 193–196, plate.

Description of a specimen found in the Upper Gondwánas.

Filhol, H. Mollusques fossiles trouvés dans les dépôts de phosphate de Chaux du Quercy. [Shells from Quercy Phosphate-deposits.] *Ann. Sci. Géol.* t. viii. pp. 274–297, pls. 27, 28.

Their affinities are with those living now in warm climates of the East—Siam, Cochin-China, &c. The following are new (4 described by **Bourguignat**)—*Leucochroa Milne-Edwardsiana*, *Helix subnanina*, *H. naninopsis*, *H. aziospudasta*, *H. calyptogyra*, *Otopoma Filholi* (Bourg.), *Pomatias Filholi* (Bourg.), *Hybocystis Filholi* (Bourg.), *Hy. Desnoyersiana*, *Hy. Milne-Edwardsiana*, *Hy. Bourguignatiana*, *Hy. europæa*, *Hy. Chatiniana*, *Limnæa Filholi* (Bourg.), *L. Milne-Edwardsiana.* E. B. T.

Ford, S. W. On some Embryonic Forms of Trilobites from the Primordial Rocks at Troy, N. Y. *Amer. Journ.* ser. 3, vol. xiii. pp. 265–273, pl. iv.

Describes the early and adult forms of *Olenellus asaphoides*, from L. Potsdam Limestone.

Fuchs, Theodor. Die geologische Beschaffenheit der Landenge von Suez. [The Geological Structure of the Isthmus of Suez.] *Denkschr. k. Ak. Wiss. math.-nat. Classe*, Bd. xxxviii. Abth. ii. pp. 28-42, pls. i., ii.

The first part is geological (see p. 148, notice of abstract); but the second (pp. 39-42) is palæontological. The new species described are *Teredinopsis problematica*, *Pecten Vasselii*, *P. isthmicus*, *P. Lessepsii*, and *Ostrea pseudo-crassissima*. The first consists of an aggregation of irregular calcareous tubes, each of which is closed superiorly by a hemispherical convex plate; the tubes are sometimes partitioned by septa. Though specimens are abundant, the nature of the fossil is uncertain.
H. A. N.

Gabb, W. M. Notes on American Cretaceous Fossils, with Descriptions of some new species. *Proc. Ac. Nat. Sci. Philadel.* for 1876, pp. 267-324, pl. xvii.

Describes a large number of fossils from the Cretaceous deposits of Georgia and New Jersey. The following species are new—*Nautilus Bryani*, *Fusus* (*Exilifusus*, n. subgen.) *Kerri*, *Surcula strigosa*, *Drillia Georgiana*, *Tritonium* (*Lagena*?) *edentatum*, *Nassa globosa*, *Fasciolaria* (*Cryptorhytis*) *crassicosta*, *F.* (*C.*) *obliquicostata*, *Ptychosyca inornata*, *Scalaria* (*Opalia*) *Thomasi*, *S.* (*O.*) *cyclostoma*, *Aporrhais* (?) *bicarinata*, *Gyrotropis squamosus*, *Laxispira lumbricalis*, *Bivonia* (?) *Cretacea*, *Ataphrus Kerri*, *Pholadomya Littlei*, *Schizodesma* (?) *appressa*, *Tellina* (*Tellinella*) *Georgiana*, *Gari elliptica*, *Peronæoderma Georgiana*, *Trigonia angulicosta*, *Idonearca carolinensis*, *I. alabamensis*, *I. Littlei*, *Trigonarca cuneata*, *Neithea complexicosta*, *Ostrea Bryanii*, *O. Littlei*, *O. exogyrella*, and *Paliurus* (n. gen.) *triangularis*, a Serpuloid Annelide. Among the Gasteropods, *Volutoderma* and *Volutomorpha* (allied to *Voluta*), *Ptychosyca* (allied to *Ficus*), *Gyrotropis* (allied to *Trichotropis*), *Laxispira* (allied to *Vermetus*), and *Endoptygma* (allied to *Phorus*) are proposed as new genera.
H. A. N.

——. Description of a Collection of Fossils, made by Doctor Antonio Raimondi in Peru. *Journ. Ac. Nat. Sci. Philadel.* n. ser. vol. viii. pt. iii. pp. 263-336, pls. 35-43.

Part I. *Tertiary Fossils.* (See *Amer. Journ. Conchology*, vol. v.)

Part II. *Secondary Fossils.* The new species described are:—*Ammonites Raimondianus*, *A. carbonarius*, and *A. ventanillensis*, Liassic; *A. corniferus* and *A. Andii*, Jurassic; *A. ollonensis*, Cretaceous. Of Gasteropoda:—*Perissolax trochoides*, Cretaceous; *Gyrodes contracta*, Liassic; *G. lirata*, Cretaceous; *Prisconatica* (n. gen.) *ovoidea*, *P. inconspicua*, *P. ampla*, Cretaceous?; *Turritella Raimondii*, Liassic; *T. peruana*, Cretaceous; *Cinulia antiqua*, Liassic?; *Actæonella oviformis*, Cretaceous; *Petropoma* (n. gen.) *peruana* and *Helcion carbonarius*, Liassic. Of Lamellibranchiata:—*Panopæa undulata*, Cretaceous; *Cor-*

bula nuculoides, *C. peruana*, *C. Raimondii*, Lias; *Pholadomya australis*, Cretaceous; *P. Raimondii*, Jurassic?; *Homomya incurva*, Cretaceous or Jurassic?; *H. ponderosa*, Cretaceous; *Tellina ? peruana*, *Cardium* (*Protocardia*) *appressum*, and *Crassatella caudata*, Liassic; *Cardita* (*Cyclocardia*) *circularis*, Cretaceous?; *Myophoria spiralis*, *Pteria inconspicua*, and *Barbotia? Raimondii*, Liassic; *Trigonarca Orbignyana*, Cretaceous or Jurassic? *T. peruana* and *Arca? ovalis*, Cretaceous; *Nucula peruana*, Liassic; *Pecten Raimondii* and *P. argentarius*, no geological age given; *Plicatula torta*, *Anomia peruana*, and *Placunanomia* (*Paranomia* ?) *lima*, Cretaceous. Of Brachiopoda—*Terebratula Raimondiana* and *Rhynchonella Antonii*, no geological age given. Of Echinodermata:—*Botriopygus elevatus*, *B. compressus*, *Ennalaster peruanus*, and *Periaster australis*, Cretaceous; *Discoidea numismalis*, Cretaceous?

Part III. *Carboniferous Fossils*: *Terebratula titicacensis*, *Productus Papilio*, and *P. reticulatus*, from Lake Titicaca.

Part IV. Bibliography of South American Palæontology. Part V. Synopsis of South American Palæontology. R. B. N.

Gardner, J. Starkie. On British Cretaceous *Patellidæ*, and other Families of Patelloid Gastropoda. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 192–205, pls. vii.–ix.

The new species described are:—Among the Patellidæ, *Tectura formosa*, *T. plana*, *Helcion Meyeri*, *Anisomyon vectis*, *Scurria calyptræiformis*, and *S. depressa*; among the Fissurellidæ, *Emarginula puncturella*, *E. divisiensis*, *E. ancistra*, *E. Meyeri*, and *Puncturella antiqua*; among the Calyptræidæ, *Calyptræa concentrica*, *Crepidula chamæformis*, and *Crucibulum giganteum*; and among the Capulidæ, *Pileopsis neocomiensis*, *P. dubia*, *P. Seeleyana*, and *Hipponyx Dixoni*. H. A. N.

——. Notes on Cretaceous Gasteropoda. *Geol. Mag.* dec. ii. vol. iv. pp. 556, 557, pl. xvi.

The new species *Hipponyx neocomiensis*, from L. Greensand, and *Dentalium major*, from Grey Chalk, are described and figured. Also a series of specimens which unite *Crepidula gaultina*, *C. Cooksoniæ*, and *C. alta*. A. J. J-B.

Gemmellaro, Prof. G. G. Sopra alcune Faune Giuresi e Liasiche di Sicilia. Studi Paleontologici. [Jurassic and Liassic Fauna of Sicily.] Fasc. 3 (1874). See p. 330.

Fasc. 4. Sui fossili della zona con *Peltoceras transversarium*, Quenst. sp. della Provincia di Palermo e di Trapani. [Oxfordian.] Pp. 113–124, pls. xiii., xiv. *Atti Ac. Sci. Lett. Palermo*, vol. iv. The new species are *Lytoceras Gastaldii*, *Perisphinctes Airoldii*, *P. Tyrrhenus*, *P. Regalmicensis*, and *Aspidoceras Helimense*.

Fasc. 5. Sopra alcuni fossili della zona con *Posidonomya alpina*, Gras, di Sicilia. [Fossils of *Posidonomya alpina* zone (Oxfordian).] Pp. 125–155, pls. xiv., xviii.–xx. *Giorn. Sci. Nat. Econ. Palermo*, vol. xii. pp. 51–81, pls. iii.–iv. *bis*. The new species are *Lytoceras tri-*

partitiforme, *Oppelia plicatella*, *O. undatiruga*, *Haploceras monachum*, *Stephanoceras Daubenyi*, *Cosmoceras ditomoplocum*, *Perisphinctes Hoffmanni*, *P. problematicus*, *Terebratula pteroconcha*, *T. Erycina*, and *T. Phryne*.

Fasc. 6. Sopra alcuni fossili della zona con *Peltoceras transversarium* Quenst. sp. del monte Erice o San Giuliano, nella Provincia di Trapani. [Oxfordian.] Pp. 156–172, pl. xx. *Giorn. Sci. Nat. Econ. Palermo*, vol. xii. pp. 82–98, pl. iv. *bis*. The new species are *Perisphinctes Aeneas*, *P. trichoplocus*, and *Aspidoceras Phœnicium*.

Fasc. 7. Sopra i Cefalopodi della zona inferiore degli strati con *Aspidoceras acanthicum* di Sicilia. [Corallian Cephalopoda.] Pp. 173–232, pls. xv.–xvii. *Atti Ac. Gioen. Sci. Nat.* ser. 3, t. xi. The new species are *Amaltheus Dedaleus*, *Perisphinctes Pancerii*, *Simoceras Sartoriusi*, *Aspidoceras Fontannesi*, *A. endoclimacum*, and *A. diplodesmum*. R. B. N.

Goldenberg, Dr. F. Fauna Saræpontana Fossilis. Die fossilen Thiere aus der Steinkohlenformation von Saarbrücken. II. Heft, pp. iv and 54; 3 pls. 4to. *Saarbrücken*.

Describes as new species:—*Palæorbis hamatus*, *Anthracosia gigantea*; of Insects, *Dictyoneura elegans*, *D. elongata*, *D. Schmitzii*, *D. obsoleta*, *Eugereon Boeckingi*, *Termes laxa*, *Termetidium amissum*, *T.? rugosum*, *Blattina Wemmetsweileriensis*, *B. intermedia*, *B. venosa*, *B. scaberata*, *Fulgorina Lebachensis*; of Crustacea, *Carcinochelus anthracophilus*, *Estheria limbata*, *E. rimosa*, *Anthrapleurion inerme*. Gives a list of fossil *Blattinæ*, 76 species, and *Estheriæ*, 19 or 20 species and varieties. R. E., Jun.

Grinnell, G. B. Notice of a new Genus of Annelids from the Lower Silurian. *Amer. Journ.* ser. 3, vol. xiv. pp. 222, 230.

Describes *Nereidavus varians*, n. gen. and sp., from near Cincinnati.

Hall, C. E. Contribution to Paleontology from the Museum of the Second Geological Survey of Pennsylvania. *Proc. Amer. Phil. Soc.* vol. xvi. pp. 621, 622.

Describes *Dolichopterus Mansfieldii*, n. sp., from the Coal Measures of Pennsylvania.

Hall, Prof. James, and R. P. Whitfield. Palæontology.—Part II. *Rep. U. S. Geol. Expl. 40th Parallel*, vol. iv. pp. 198–302, pls. i.–vii.

The fossils described include forms from the U. Cambrian to the Jurassic. The following are described as new species:—from strata of Potsdam age, *Obolella discoida*, *Lingulepis mæra*, *L.? minuta*, *Kutorgina minutissima*, *Leptæna melita*, *Crepicephalus* (*Loganellus*) *Haguei*, *C. nitidus*, *C. granulosus*, *C. maculosus*, *C. unisulcatus*, *C. simulator*, *C. anytus*, *C.* (*Bathyurus?*) *angulatus*, *Conocephalites* (*Pterocephalus*) *laticeps*, *Ptychaspis pustulosa*, *Chariocephalus tumifrons*, *Dikellocephalus bilobatus*, *D. multicinctus*, *D. flabellifer*, *Agnostus communis*, *A. neon*, *A. prolongus*, and *A. tumidosus*; from L. Silurian rocks, *Lingulepis ella*, *Orthis Pogonipensis*, *Strophomena nemea*, *Porambonites obscurus*, *Raphistoma acuta*, *Maclurea minima*, *Fusispira compacta*, *Cyrtolites sinuatus*, *Conocephalites subcoronatus*, *Crepicephalus ? quadrans*, *Dikellocephalus quadriceps*, *D. Wahsatchensis*, *D.? Gothicus*, *Bathyurus Pogonipensis*, *Ogygia producta*, and *O. parabola*; from Devonian, *Rhynchonella Emmonsi*, *Paracyclas peroccidens*, *Nuculites triangulus*, and *Bellerophon neleus*; from the Waverley Group, *Chonetes Loganensis*, *Athyris Claytoni*, *Terebratula Utah*, *Euomphalus* (*Straparollus*) *Utahensis*, *E. Ophirensis*, *Proetus peroccidens*, and *P. Loganensis*; from deposits referable to the Coal Measures and Permo-Carboniferous, *Aviculopecten Weberensis*, *A. curtocardinalis*, *A. parvulus*, *Cyrtoceras cessator*, and *Goniatites Kingii*; from Triassic deposits, *Spirifera* (*Spiriferina*) *alia* and *Edmondia myrina*; from the Jurassic rocks, *Terebratula Augusta*, *Aviculopecten* (*Eumicrotis?*) *augustensis*, *Camptonectes pertenuistriatus*, *Lima* (*Plagiostoma*) *occidentalis*, *Trigonia quadrangularis*, *Septocardia* (gen. nov.) *typica*, *S. carditoidea*, *Astarte? arenosa*, and *Natica? Lelia*. H. A. N.

Haughton, Rev. Prof. Samuel. Description of a fossil Spider (*Architarbus subovalis*, H. Woodw.) from the Middle Coal Measures, Burnley, Lancashire. *Journ. R. Geol. Soc. Ireland*, ser. ii. vol. iv. pt. 4, pp. 222, 223; 2 woodcuts.

Additional details of structure given.

Hector, J. On a New Trilobite (*Homalonotus expansus*, Hector). *Trans. N. Zealand Inst.* vol. ix. p. 602, t. 27. f. 2.

From the Mount Arthur Series (U. Silurian?) at Reefton. Distinguished from *H. delphinocephalus* and *H. Harrisoni* by its great proportional width, &c. R. E., Jun.

Hilgendorf, F. Noch einmal *Planorbis multiformis*. *Zeitschr. deutsch. geol. Ges.* Bd. xxix. pp. 50–62.

Arguments in favour of previous views as to the connexion and distinction between variable forms and their occurrence in different beds, in opposition to those in Sandberger's book (see also p. 73). E. B. T.

Hudleston, W. H., and J. F. Walker. On the Distribution of the Brachiopoda in the Oolitic Strata of Yorkshire. *Ann. Rep. Yorksh. Phil. Soc.* for 1876, pp. 7–12.

List, with remarks on range, &c.

Hutton, Capt. F. W. Description of some New Tertiary Mollusca from Canterbury. *Trans. N. Z. Inst.* vol. ix. pp. 593–598, pl. 16.

Fossils collected from White Rock River, Mount Harris, Point Hill (Waitaki), and the greensands at Waiho. The new species described are *Typhis hebetatus*, *Fusus dentatus*, *F. tegens*, *Neptunæa* (*Sipho*) *costatus*, *Drillia fusiformis*, *Bela ? robusta*, *Clavatula Haasti*, *Defrancia excavata*, *Cominella subnodosa*, *C. ordinata*, *Nassa* (*Uzita*) *compta*, *Turbinella brevirostris*, *Lunatia suturalis*, *Sigaretus carinatus*, *Turritella* *haustator*, *T. concava*, *Cladopoda directa*, *Cyclostrema helicoides*, *Corbula sulcata* [not *C. sulcata*, Lam.], *Leda semiteres*, *Anomia trigonopsis*. R. E., Jun.

Issel, Prof. Arturo. Appunti paleontologici. I. Fossili delle Marne di Genova. [Fossils of the Genoa Marls.] 8vo. *Genoa.*

Describes this L. Pliocene deposit, and 150 invertebrate fossils found in it, more than two thirds of which are of extinct species.

Jeffreys, J. G. The Post-Tertiary Fossils procured in the late Arctic Expedition, with Notes on some of the Recent or Living Mollusca from the same Expedition. *Annals*, ser. 4, vol. xx. pp. 229–242, and *Rep. Brit. Assoc. for* 1877, *Sections*, p. 72 (1878).

Gives a list of the fossils, with notes on the more interesting forms. All the forms live in Arctic seas.

——. Note [to paper on "The Post-Tertiary Beds of Grinnell Land and North Greenland," by Captain Feilden (noticed *post* in ADDENDA)]. *Annals*, ser. 4, vol. xx. pp. 489–494.

A list of the Post-Tertiary fossils, with additional notes and references to further stations.

Jones, T. Rupert. The late Prof. Ch. G. Ehrenberg's Researches on the Recent and Fossil Foraminifera. *Micr. Journ.* no. 17, pp. 308–311 and vol. xviii. pp. 49–51.

Gives references to, and an account of, the works of Ehrenberg on these subjects.

Koninck, Prof. L. G. de. Recherches sur les Fossiles Paléozoïques de la Nouvelle Galles du Sud (Australie). [Palæozoic Fossils of New South Wales. Part III.] Pp. 232. 8vo. *Brussels.*

A census of the species from the Carboniferous rocks of N. S. Wales with which this part is occupied gives :—Crustacea 5 species, Actinozoa 16, Echinodermata 7, Polyzoa 11, Brachiopoda 43, Lamellibranchiata 60, Gasteropoda 24, Pteropoda 4, Cephalopoda 6, and 1 fish. The new species are *Axophyllum Thomsoni*, *Cyathophyllum inversum*, *Lophophyllum minutum*, *L. corniculum*, *Zaphrentis Gregoryana*, *Z. cainodon*, *Z. robusta*, *Cyathaxonia minuta*, *Symbathocrinus ogivalis*, *Cyathocrinus Koninckii* (W. B. Clarke), *Palæaster Clarkei*, *Dendricopora Hardyi*, *Fenestella propinqua*, *Retepora ? laxa*, *Rhynchonella inversa*, *Spirifer Strzeleckii*, *S. Clarkei*, *S. exsuperans*, *Scaldia ? depressa*, *S. ? lamellifera*, *Sanguinolites Mitchellii*, *S. Etheridgei*, *S. M'Coyi*, *S. Tenisoni*, *Cardiomorpha gryphoides*, *C. ? striatella*, *Edmondia nobilissima*, *E. intermedia*, *Pachydomus Danai*, *Mœnia Konincki* (W. B. Clarke), *Pleurophorus Morrisii*, *P. biplex*, *Tellinomya Darwini*, *Palæarca interrupta*, *P. subarcuata*, *Mytilus crassiventer*, *M. Bigsbyi*, *Aviculopecten Hardyi*, *A. profundus*, *Aphanaia gigantea*, *Avicula sublunulata*, *A. Hardyi*, *A. decipiens*, *A. intumescens*, *Dentalium cornu*, *Pleurotomaria humilis*, *P. helicinœformis*, *Loxonema difficilis*, *L. acutissima*, *Cameroceras Phillipsii*, *Entomis Jonesi*. The new genera proposed are *Dendricopora* and *Protoretepora* (Polyzoa), *Clarkia* and *Aphanaia* (Lamellibranchiata). R. E., Jun.

Krause, A. Die Fauna der sogenannten Beyrichien- oder Choneten-Kalke des norddeutschen Diluviums. [Fauna of *Beyrichia* Limestone of N. German Drift.] *Zeitschr. deutsch. geol. Ges.* Bd. xxix. pp. 1–49, tab. 1.

Describes the new species *Fenestella striato-punctata*, *Discina orbiculoides*, *Strophomena variecostata*, *Conocardium reticulatum*, *Bellerophon substriatus*, *Conularia lanceolata*, *Orthoceras Damesii*, *Primitia minuta*. Deducting these, 60 species remain, of which 38 occur in English U. Silurian, 38 in Gothland, and 44 in Oesel. The abundance of *Beyrichia Buchiana* in some blocks points to an origin at Oestergarn, Gothland; those with fish-remains especially are referred to Oesel, while others come probably from Schonen. E. B. T.

Küntgen, K. Die Trilobiten des K. G.-H. naturhistorischen Museums. [Trilobites of the Luxemburg Museum.] *Publ. Inst. R. G. D. Luxemb.* t. xvi. p. 127.

——. Die Mollusken unserer Sammlung. [Mollusca of Luxemburg Museum.] *Ibid.* p. 170.

Lefèvre, Th. Rapport sur la Description de la *Rostellaria robusta* de M. Rutot. [*R. robusta*, Rutot.] *Ann. Soc. Mal. Belg.* t. xi. *Bull.* pp. 8.

Concludes that *R. robusta* is not specifically separable from *R. ampla*, and points out that Solander is really the author of the latter, and not Brander. H. A. N.

Linnarsson, G. Om faunan i lagren med *Paradoxides ölandicus*. [Fauna of the Beds with *Paradoxides ölandicus* in Oland, Sweden.] *Geol. Fören. Stockholm Förh.* Bd. iii. pp. 352–375; 2 pls.

The beds show, with regard to the fossils, several points of agreement with Barrande's étage C in Bohemia, and to the lower parts of the Menevian in Wales. The following new species are described and figured—*P. Sjögreni*, *P. aculeatus*, *Ellipsocephalus polytomus*, *Conocoryphe emarginata*, *Selenopleura cristata*, *Hyolithus teretiusculus*. E. E.

Locard, A. Description de la Faune des Terrains Tertiaires Moyens de la Corse. Description des Echinides par **Gustave Cotteau.** [Fauna of M. Tertiaries of Corsica.] *Ann. Soc. Agric. Lyon*, t. ix. pp. ix, 374; 17 pls. 8vo. *Paris* and *Geneva.*

The following appear to be new species of Mollusca—*Cassis corsicanus*, *Conus paradoxus*, *Voluta Peroni*, *Xenophora Peroni*, *Pecten Bonifaciensis*, *P. Rockii*, *Lithodomus latus*, *L. minimus*, *Cypricardia globulosa*, *Jouannetia Tournoueri*, and a new species of coral, *Solenastræa Peroni*. The new species of Echinodermata described by **M. Cotteau** appear to be *Cidaris Hollandei*, *C. Peroni*, *Psammechinus Peroni*, *Amphiope Hollandei*, *Echinanthus corsicus*, *Schizaster Peroni*, *S. Baylei*, *Pericosmus Orbignyi*, *P. Peroni*, *Echinocardium Peroni*, *Macropneustes Peroni*, *Brissus Corsicus*, *Lovenia Peroni*, *Spatangus Peroni*. R. E., Jun.

Lóczy, Ludwig. Nehany Echinoida a Tehérkörösvölgy Neogena-rétegeiböl. [Neogene Echini from the White Koros Valley.] *Termész. Füz.* Bd. pt. 1, Magyar, pp. 39–44; German, pp. 62–67, pl. v.

Loriol, P. de. Monographie des Crinoïdes fossiles de la Suisse. (Part 1.) [Swiss Fossil Crinoids.] *Abh. schweiz. pal. Ges.* Bd. iv. pp. 52, pls. 1–8.

The new species are *Encrinus Greppini*, *Apiocrinus Gillieroni*, *Millericrinus Choffati*, *M. Thiessingi*, *M. Studeri.*

——. Monographie paléontologique des couches de la zone à *Ammonites tenuilobatus* de Baden. [*A. tenuilobatus* Beds of Baden.] (Part 2.) *Abh. schweiz. pal. Ges.* Bd. iv. pp. 33–76, pls. 5–12. (See Geological Record for 1876, p. 282.)

The new species are *Oppelia Tysias*, *Perisphinctes Rütimeyeri*, *P. balnearius*, *P. Ernesti.*

Lycett, John. A Monograph of the British Fossil *Trigoniæ.* No. iv. pp. 149–204, pls. xxviii.–xl. *Pal. Soc.*

The *Costatæ* are completed, and the *Byssiferæ* are dealt with, a section being concerned with species not received in time to be described in their proper places. The new species are *Trigonia bella*, *T. Culleni*, *T. exaltata*, *T. Dunscombensis*, *T. debilis*, *T. crenulifera*, *T. Hudlestoni*, *T. Keepingi*, *T. Witchelli*, and *T. Snaintonensis.* H. A. N.

Mantovani, Pio. Intorno ad alcuni Ammoniti dell' Apennino dell' Emilia. [Ammonites of the Emilian Apennines.] Pp. 14. 8vo. *Reggio d' Emilia.*

Manzoni, Dr. A. I Briozoi fossili del Miocene d'Austria ed Ungheria. [Fossil Bryozoa of the Miocene of Austria and Hungary. Part 3.] *Denkschr. k. Ak. Wiss. math.-nat. Classe*, Bd. xxxviii. Abth. ii. pp. 1–24, pls. i–xviii.

Deals with species belonging to the *Crisididæ*, *Idmoneidæ*, *Entalophoridæ*, *Tubuliporidæ*, *Diastoporidæ*, and *Cerioporidæ*. The new forms described are *Idmonea vibicata*, *Filisparsa elegantissima*, *F. astalis*, *F. typica*, *Pustulopora rugulosa*, *P. proboscina*, *Patinella cyatiformis*, *Discotubigera insignis*, and *D. actinoides.* H. A. N.

Mayer, K. Palæontologie der Pariserstufe von Einsiedeln und seiner Umgebungen. [Palæontology of the Einsiedeln Parisian.] *Mat. Cart. Géol. Suisse*, livr. 14, pp. 343-442 ?, pls. viii.–xi. ?

Meek, Prof. J. B. Palæontology. Part I. *Rep. U. S. Geol. Expl.* 40 *Parallel*, vol. iv. pp. 1–197, pls. i.–xvii.

The fossils described are from Silurian to Tertiary formations. Of the Devonian species, *Alveolites multilamella*, *Ptychophyllum ? infundibulum*, *Diphyphyllum fasciculum*, *Cyathophyllum Palmeri*, *Spirifer (Trigonotreta) argentarius*, *Edmondia ? Pinonensis*, *Orthoceras Kingii*, and *Proetus (Phaeton) denticulatus* are new. Of Carboniferous forms, *Zaphrentis excentrica*, *Cyathophyllum* (*Campophyllum*?) *Nevadense*, *C. subcæspitosum*, *Productus Nevadensis*, *P. subhorridus*, *Athyris* ? *persinuata*, *Posidonomya* ? *fragosa*, *Aviculopecten catactus*, *A. occidaneus*, and *Goniatites goniolobus*. The new Triassic species are *Sphæra Whitneyi*, *Modiomorpha* ? *ovata*, *M.* ? *lata*, *Gymnotoceras rotelliforme*, *Arcestes* ? *perplanus*, *Acrochordiceras Hyatti*, *Entomoceras Laubei*, and *Eudiscoceras Gabbi*. The genera *Coroceras*, *Gymnotoceras*, *Acrochordiceras*, *Entomoceras*, and *Eudiscoceras*, and the families *Clydonitidæ*, *Trachyceratidæ*, and *Physanoidæ*, among the *Ammonitidæ* are proposed as new by **Prof. Hyatt.** Of the Jurassic forms, *Lima* (*Limatula*) *erecta*, *Pinna Kingii*, *Cucullæa Haguei*, *Myacites inconspicuus*, *M.* (*Pleuromya*) *Weberensis*, and *Belemnites Nevadensis* are new; and of the Cretaceous forms, *Anomia ractiformis*, *Inoceramus erectus*, *Cucullæa* (*Trigonarca* ?) *obliqua*, *Axinæa wyomingensis*, *Mactra* ? *Emmonsi*, *M.* (*Trigonella* ?) *arenaria*, *M.* (*Cymbophora*)? *utahensis*, *Tellina* ?? *isonema*, *T. modesta*, *Gyrodes depressa*, and *Anchura* ? *fusiformis*; from Tertiary strata, *Limnæa* (*Polyrhytes*) *Kingii* is new. H. A. N.

Mercey, N. de. Description de l'*Inoceramus Mantelli*. *Mém. Soc. Linn. N. France*, t. iv. pp. 324–347; 2 pls.

Milaschewitsch, K. O. Paleontologitcheskie Etudi. I. Onyekotoriche iskopaemiche myelovoe formatsii ve Krimu. [Cretaceous Fossils from the Crimea.] *Bull. Soc. Imp. Nat. Mosc.* t. lii. pt. 2, pp. 65–128, pl. i.

Remarks on several species, chiefly Cephalopoda. Proposes the new name *Haploceras typus* for *Ammonites strangulatus*. Describes the new species *Acanthoceras tenuicostatum* and *Nautilus Stschurowskii*.

W. H. D.

Miller, Dr. K. Foraminiferen in der schwäbisch-schweitzischen miocänen Meeresmolasse als Leitfossilien. [Characteristic Foraminifera of the Marine Miocene of Swabia and Switzerland.] *Jahresh. Ver. Nat. Württ.* Jahrg. 33, pp. 295–298.

The species are mentioned; but no new ones are described.

Miller, S. A. The American Palæozoic Fossils. A Catalogue of the Genera and Species, with names of authors, dates, places of publication, Groups of Rocks in which found, and the Etymology and Signification of the words, and an Introduction devoted to the Stratigraphical Geology of the Palæozoic Rocks. Pp. 254. 8vo. *Cincinnati.*

Also contains a chapter by **Prof. E. W. Claypole** on the construction of palæontological names.

Mörch, O. Fortegnelse over Forsteningerne i Kridtformationen paa Bornholm. [List of the Chalk Fossils of Bornholm.] Fortegnelse over Forsteningerne i Grönsands-dannelsen ved Lellinge. [List of Fossils of the Greensand of Lellinge, Denmark.] *Vid. Medd. Nat. Foren. Kjöbenhavn*, 1876.

The names of 78 species from the former locality and of 43 from the latter are given.

Molon, F. Catalogo dei corallarî fossili nel Terreno Nummulitico delle prealpi Venete, compilato dal Dott. F. D'Achiardi, Cenno critico. [Catalogue of Nummulitic Corals of Venetia.] 8vo. *Vicenza.*

Nicholson, Prof. H. A., and Robert Etheridge, Jun. Notes on the Genus *Alveolites*, Lamarck, and on some Allied Forms of Palæozoic Corals. *Journ. Linn. Soc.* vol. xiii. pp. 353–370, pls. xix., xx.

Discuss the characters and structure of the genus, as typified by *A. suborbicularis*. *Cœnites* is briefly treated of; and the structure of *Pachypora* is discussed. *Alveolites Fischeri* and *A. frondosa*, from the Devonian of S. America, are referable to *Pachypora*. *Alveolites septosa*, *A. depressa*, and *Chætetes radians* belong to a single natural group, and reasons are given for thinking that all of them are referable to *Chætetes*. The new species *Chætetes hyperboreus*, from the L. Carboniferous rocks of Scotland, is described. H. A. N.

——, ——. On *Ascodictyon*, a new provisional and anomalous Genus of Palæozoic Fossils. *Annals*, ser. 4, vol. xix. pp. 463–468, pl. xix.

Propose this generic title for some singular parasitic organisms, of uncertain affinities, found in the Devonian rocks of N. America and the Carboniferous deposits of Britain. The American species, *A. fusiforme* and *A. stellatum*, are described. *A. radians* is also described as new, from Scotland. H. A. N.

——, ——. Contributions to Micro-Palæontology.—I. On the Genus *Tetradium*, Dana, and on a British Species of the same. II. On *Prasopora Grayæ*, a new Genus and Species of Silurian Corals. *Annals*, ser. 4, vol. xx. pp. 161–169, 388–392; 2 woodcuts.

I. Describe the minute characters of *Tetradium minus*, Safford, from the Cincinnati group of Ohio. Also a singular new coral, *Tetradium Peachii*, found in pebbles of U. Silurian limestone in the Old Red Sandstone conglomerate of Habbie's Howe, in the Pentland Hills.

II. Found the new genus *Prasopora* for the reception of certain peculiar corals belonging to the Chætetidæ. The only known species found in the Craighead Limestone (L. Silurian) of Girvan, Ayrshire, is described. H. A. N.

Nikitin, S. Ueber *Mesites Pusirefskii* Hoffm. eine merkwürdige Cystideen-Art. *Bull. Soc. Imp. Nat. Mosc.* t. lii. pp. 301–304, pl. iv.

This Echinoderm was found in the glauconitic limestone of Iswos, on the Wolchow. Additional details are shown by fresh specimens.

Parker, Prof. W. K., and Prof. T. R. Jones. On *Ovulites margaritula*. *Annals*, ser. 4, vol. xx. pp. 77–79.

Shows that *Ovulites* is referable to the Dactyloporidæ, and is porcellaneous.

Quenstedt, F. A. Petrefactenkunde Deutschlands. Bd. v. Korallen. Heft 1, pp. 1–96, pls. 115–118; Heft 2, pp. 97–208, pls. 119–124; Heft 3, pp. 209–320, pls. 125–130. 8vo. *Leipzig.*

Devoted to sponges. The first 25 pages consist of a general history of sponges, and description of their parts; the remainder is given up to specific descriptions. Makes no clear distinction between new species and old species re-described, and gives little synonymy. R. E., Jun.

Rutot, A. Description de la Faune de l'Oligocène Inférieur de Belgique. [Description of the Fauna of the Belgian L. Oligocene.] Fasc. I. Pp. 67, pls. i.–iv. *Ann. Soc. Mal. Belg.* vol. xi.

Describes the L. Oligocene briefly, and its fauna in detail. Remains of Vertebrates are almost unknown; but a few species of fishes have been detected. Crustacea are very rare, and Cephalopoda are wanting in Belgium. The remainder of the work is occupied with a description of the species of *Strombus*, *Rostellaria*, *Murex*, *Triton*, and *Typhis*. The following new varieties are described—*Murex Deshayesi*, var. *prisca*, and *Typhis fistulosus*, var. *priscus*. H. A. N.

Schwager, Corr. Quadro del proposto Sistema di Classificazione dei Foraminiferi con guscio. [Table of Classification of Foraminifera with shells.] *Boll. R. Com. geol. Ital.* t. viii. pp. 18–27, plate. See Geological Record for 1876, p. 291.

Scudder, S. H. The Insects of the Tertiary Beds at Quesnel. [Entered under **Selwyn**, p. 128.]

The new species described are:—among Hymenoptera, *Formica arcana*, *Hypoclinia obliterata*, *Aphenogaster longæva*, *Pimpla saxea*, *P. senecta*, *H. decessa*, and *Calyptites* (n. gen.) *antediluvianum*; among Diptera, *Boletina sepulta*, *Brachypeza abita*, *B. procera*, *Trichonta Dawsoni*, *Anthomyia inanimata*, *A. Burgessi*, *Heteromyza senilis*, *Sciomyza revelata*, *Lithortalis* (n. gen.) *picta*, *Lonchæa senescens*, and *Palloptera morticina*; anong Coleoptera, *Prometopia depilis*; and among Hemiptera, *Lachnus petrorum*. H. A. N.

——. The first discovered traces of Fossil Insects in the American Tertiaries. *Bull. U.S. Geol. Surv. Terr.* vol. iii. no. 4, pp. 741–762.

The new species are:—3 Hymenoptera, *Camponotus vetus*, *Liometopum pingue*, *Ichneumon petrinus*; 24 Diptera, *Culex proavitus*, *Corethra exita*, *Chironomus depletus*, *C. patens*, *Lasioptera recessa*, *Lithomyza* (n. gen.) *condita*, *Dicranomya stigmosa*, *D. primitiva*, *D. rostrata*, *Spiladomyia* (n. gen.) *simplex*, *Pronophlebia* (n. gen.) *rediviva*, *Cyttaromyia* (n. gen.) *fenestrata*, *Tipula decrepita*, *T. tecta*, *Mycetophila occultata*, *Sackenia* (n. gen.) *arcuata*, *Gnoriste dentoni*, *Acrocera hirsuta*, *Eristalis lapideus*, *Musca ascarides*, *M. bibosa*, *M. hydropica*, *M. vinculata*, *Heteromyza detecta*; 5 Hemiptera, *Aphana atava*, *Delphax senilis*, *Tettigonia obtecta*, *Bythoscopus lapidescens*, *Pachymerus petrensis*; Neuroptera, *Phryganea operta*. W. H. D.

Scudder, S. H. Description of Two Species of Carabidæ found in the Interglacial Deposits of Scarboro' Heights, near Toronto, Canada. *Bull. U.S. Geol. Surv. Terr.* vol. iii. no. 4, pp. 763, 764.

Describes the new species *Loricera glacialis* and *Loxandrus gelidus* from the beds described by Mr. Hinde.

Seguenza, Prof. G. Nuculidi terziarie nelle provincie meridionali d'Italia. [Tertiary Nuculidæ of S. Italy.] *Atti R. Ac. Linc.* ser. 3, *Mem.* vol. i. pp. 1163–1190; 5 pls. Abstract in *Trans.* vol. i. pp. 63, 64.

Describes and figures 58 species, giving a table showing the distribution in European beds and recent seas: 15 species are Miocene, 51 Pliocene, 5 Quaternary, and 16 Recent. All the Quaternary occur in the Pliocene, and still exist. Of the Miocene, 4 are extant. 34 are exclusively S. Italian. The new species are *Nucinella calabra*, *Leda peraffinis*, *Yoldia sinuosa*, and *Neilo messanensis*, all Miocene. W. H. D.

Shaler, Prof. N. S. On the Occurrence of the genus *Beatricea* in Kentucky. *Amer. Nat.* vol. xi. p. 628.

Occurs in strata of the age of the Cincinnati group. The genus may perhaps be referable to the Sponges.

Sintzof, —. [Description of some Mesozoic Fossils of the Simbirsk and Saratov Governments. Part I.] *Zapiski Novoruss. Obsch. Estest.* t. v. fasc. 1.

——. [Description of New or Little known Tertiary Shells of New Russia. Part III.] *Zapiski Novoruss. Obsch. Estest.* t. v. fasc. 1. See Geological Record for 1876, p. 293.

——. [Remarks on Prof. Trautschold's paper on Chalk Fossils of Russia.] *Zapiski Novoruss. Obsch. Estest.* t. v. fasc. 1. See p. 321.

Sladen, W. P. On the Genus *Poteriocrinus* and Allied Forms. *Proc. Geol. Soc. W. Riding Yorksh.* n. s. pt. iv. pp. 242–253, pl. x.

Amends Miller's description of *Poteriocrinus*, rearranging the species under that genus as limited, *Scaphiocrinus*, *Zeacrinus*, and *Dactylocrinus* (n. gen.). W. H. D.

Smithe, Dr. F. On the Occurrence of *Plicatula lævigata* of d'Orbigny in the Middle Lias of Gloucestershire. *Proc. Cotteswold Club*, vol. vi. pp. 341–347.

Describes the species from Churchdown, near Gloucester. The first record as a British fossil.

Sollas, W. J. On *Pharetrospongia Strahani*, a fossil Holoraphidote Sponge from the Cambridge "Coprolite" Bed. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 242–254, pl. xi.

Describes the external characters and structure of *Pharetrospongia* (n. gen.), from the Greensand of Cambridge, and considers that it includes siliceous sponges belonging to the family of the Renierida.
H. A. N.

——. On the Structure and Affinities of the Genus *Siphonia*. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 790–834, pls. xxv., xxvi.

Gives a bibliography of the genus, and describes it as regards both its macroscopic and microscopic characters. The states of mineralization and the classification are considered. Concludes that the genus belongs to the Lithistid sponges, and is allied to the recent *Discodermia*. A list of all described species which have been rightly or wrongly referred to *Siphonia* is given. H. A. N.

——. On the Perforate Character of the Genus *Webbina*, with a Notice of two New Species, *W. lævis* and *W. tuberculata*, from the Cambridge Greensand. *Geol. Mag.* dec. ii. vol. iv. pp. 102–105, pl. vi.

Shows that the test of *Webbina* is perforate.

——. On the Changes produced in the Siliceous Skeletons of Certain Sponges by the Action of Caustic Potash. *Annals*, ser. 4, vol. xx. pp. 285–300, pl. ix.

Deals in a detailed manner with changes in the spicules of fossil sponges.

Stache, Dr. G. Beiträge zur Fauna der Bellerophonkalke Südtirols. [Fauna of the Bellerophon Limestone of S. Tyrol.] *Jahrb. k.-k. geol. Reichs.* Bd. xxvii. pp. 271–318, tab. 5–7.

Describes the Univalves from black limestones below the L. Trias marls with *Posidonomya Clarai.* They had hitherto been put together as Bunter or Werfen beds, but are now considered to be Zechstein or U. Permian, following quite conformably below the Trias. The red Gröden sandstone would thus be Permian instead of Bunter. This view is held because of the general Palæozoic nature of the fauna. The Ostracoda and Foraminifera have been declared to have a Mesozoic facies. The following are new species—*Nautilus Hörnesii, N. crux, N. subedinus, Bellerophon Vigilii, B. cadoricus, B. Jacobi, B. Ulrici, B. sextensis, B. Gümbeli, B. fallax, B. Janus, B. comelicanus, B. pseudohelix, B. Mojsvari, Murchisonia tremontana, Turbonilla montis-crucis, Natica comelicana, N. cadorica, N. pusiuncula.* *Catinella* is a new generic name for a form between *Catinus* and *Natica.* E. B. T.

Stefani, C. de. Descrizione di nuove specie di molluschi pliocenici italiani. [New Italian Pliocene Mollusca.] *Bull. Soc. Mal. Ital.* vol. iii.

Stefani, C. de. Molluschi continentali fino ad ora notati in Italia nei terreni pliocenici, ed ordinamento di questi ultimi. [Part I.] [Continental Mollusca in Italian Pliocene.] *Pisa.*

Stoddart, W. W. List of the Characteristic Fossils of the Dundry [Inferior] Oolite. *Proc. Cotteswold Club*, vol. vi. pp. 297–300.

Records species from the Iron-shot Bed, Cephalopoda Bed, Dimyaria Bed, Ragstone Bed, and Freestone Beds.

Tate, R. On new Species of *Belemnites* and *Salenia* from the Middle Tertiaries of South Australia. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 256–259; 2 woodcuts.

Describes *Belemnites senescens* and *Salenia tertiaria* from the Tertiary deposits of Aldinga, E. coast of St. Vincent's Gulf (= the Murray-River Beds). R. E., Jun.

Taylor, J. E. Our Common British Fossils, and where to find them. *Sci. Goss.* vol. xiii. pp. 11–14, 60–64, 131–137, 251–255; many woodcuts.

Treats of the structure, development, &c. of Trilobites, Crinoids, &c.

Teller, Fr. Ueber neue Rudisten aus der böhmischen Kreideformation. [Bohemian Rudistes, &c.] *Sitz. k. Ak. Wiss. Wien, math.-nat. Cl.* Bd. lxxv. pp. 97–112; 3 pls. and woodcut.

In a Cenomanian conglomerate at Teplitz, filling cracks in porphyry, lie silicified shells, from which the following new species are described—*Sphærulites bohemicus*, *Cyprina Haueri*. The relation of *Cyprina* to *Diceras* and their differences are discussed. E. B. T.

Terquem, [O.] Observations sur l'étude des Foraminifères. [Study of Foraminifera.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 506–509, pl. xiii.

Remarks on some peculiar structures in *Spiroloculina* from sand in Rhodes, and *Lituola* and *Bolivina* from French Chalk.

Thompson, James. Descriptions of a new Genus and several new Species of Rugose Corals from the Carboniferous Limestone of Scotland. *Proc. Phil. Soc. Glasg.* pp. 9, pls.

Proposes the name of *Kumatiophyllum* for some rugose corals, and describes *K. concentricum*, *K. Harknessi*, *K. Haimeanum*, *K. octolamellum*, *K. Etheridgi*, and *K. Davidsoni* as new. *Rhodophyllum Römeri* and *R. reticulatum* are also brought forward as new species. H. A. N.

Thomson, Sir C. W. On the Structure and Relations of the Genus *Holopus*. *Proc. R. Soc. Edinb.* vol. ix. no. 98, pp. 405–410.

Holopus and the Chalk genus *Cyathidium* are probably identical. Considers the former to be another of the links between the faunæ of later geological periods and that of the present time. R. E., Jun.

Trautschold, H. Ueber Kreidefossilien Russlands. [Russian Cretaceous Fossils.] *Bull. Soc. Imp. Nat. Mosc.* t. lii. pt. 1, pp. 332–348, pls. v., vi.

Describes the new species *Avicula densicostata*, *Cardita bisulcata*, *Cucullæa obtusangula*, *Cupulispongia triloba*, and *Porospongia auriculata*. Applies the new name *Sphenodus recurvus* to *Hybodus dispar*, redescribing it.
W. H. D.

Verbeek, R. D. M. Palæontologie van Nederlandsch-Indië. [Palæontology of the Dutch East Indies.] *Jaarb. Mijn. Ned. O.-Ind.* deel 2, pp. 3–10. Introduction.

Vine, G. R. Chapters on Carboniferous Polyzoa. *Sci. Goss.* vol. xiii. pp. 108–110, 152–156, 220–222, 271–274.

Reference is chiefly made to localities in the N.E. of England. Woodcuts of fragments are given.

Vogdes, A. W. Notes on the Genera *Acidaspis*, Murchison; *Odontopleura*, Emmerich; and *Ceratocephala*, Warder. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vii. pp. 138–141.

Shows that these Trilobites form one genus, giving generic characters, and deciding that Dr. Warder's name has priority (*Amer. Journ.* 1838).

Wachsmuth, Charles. Notes on the Internal and External Structure of Palæozoic Crinoids. *Amer. Journ.* ser. iii. vol. xiv. pp. 115–127, 181–191.

Describes the mouth, the ventral furrow of the arms, the alimentary canal, the anal aperture and proboscis, the summit and its classificatory value.
W. H. D.

Wachsmuth, Charles, and Frank Springer. Revision of the genus *Belemnocrinus*, and Description of two new Species. *Amer. Journ.* ser. 3, vol. xiii. pp. 253–260.

B. florifer from the Upper and *B. Pourtalesi* from the Lower Burlington Limestone, Iowa.

Walcott, C. D. Notes on some Sections of Trilobites from the Trenton Limestone. Note upon the Eggs of the Trilobite. Descriptions of New Species of Fossils from the Chazy and Trenton Limestones. Published in advance of *Ann. Rep. New York State Mus.* September 20, plate.

1. Gives an account of the structure of Trilobites as determined by means of transverse sections. Has thus determined the existence of jointed axial appendages in *Calymene senaria*, *Ceraurus pleurexanthemus*, and other forms. Spiral branchial filaments are attached to the side of the thoracic cavity, while the thoracic limbs carry branchiferous appendages.

2. Records the discovery of ova within the body-cavity of *Ceraurus pleurexanthemus*.

3. Describes as new species *Arionellus pustulatus*, *Ceraurus rarus*, *Encrinurus Trentonensis*, *E. raricostatus*, *Acidaspis parvula*, *Dalmanites ntermedius*, *Illænus indeterminatus*, and *Asaphus homalonotoides*.
H. A. N.

White, Dr. C. A. Palæontological Papers. *Bull. U.S. Geol. Surv. Territories*, vol. iii. no. 3, pp. 599–629.

1. Descriptions of Unionidæ and Physidæ collected by Professor E. D. Cope from the Judith River Group of Montana Territory during the summer of 1876: pp. 599–602. *Unio primævus*, *U. cryptorhynchus*, *U. senectus*, *Anodonta propatoris*, *Bulimus atavus*, and *Physa Copei*, all new.

2. Descriptions of new Species of *Uniones* and a new Genus of Fresh-water Gasteropoda from the Tertiary Strata of Wyoming and Utah: pp. 603–606. *Unio proavitus*, *U. Holmesianus*, *U. Endlichi*, *U. Couesi* (olim *petrinus*), *U. Meeki* (olim *Leai*), *U. mendax*, and *Cassiopella* (n. gen.) *turricula* (=*Leioplax*? *turricula*); all from the Wahsatch group.

3. Catalogue of the Invertebrate Fossils hitherto published from the Fresh- and Brackish-water Deposits of the Western portion of North America. Pp. 607–614.

4. Comparison of the North-American Mesozoic and Cenozoic Unionidæ and associated Mollusks with Living Species: pp. 615–624. The fossil species represent the recent ancestrally; they originated, in Palæozoic times, in brackish lakes, the saltness of which favoured differentiation.

5. Remarks on the Palæontological Characteristics of the Cenozoic and Mesozoic Groups as developed in the Green River Region: pp. 625–629. Places the Laramie and Wahsatch group between Cretaceous and Tertiary as "Post-Cretaceous." W. H. D.

Whiteaves, J. F. [Fossils from British Columbia.] See **Selwyn,** p. 128.

The fossils noticed (pp. 96–106) are Jurassic or Cretaceous, Triassic, Carboniferous or Permian, Devonian or Carboniferous, Devonian, and from strata of unknown age. The descriptions of the species are short; and no new forms are named. H. A. N.

Whitfield, R. P. Preliminary Report on the Palæontology of the Black Hills. *U.S. Geol. Surv. Rocky Mts.* Pp. 50. 8vo. *Washington.*

Wilson, C. M. Corals or Reef-building Animals. ["Protoza" (*sic* and repeated in text) is the title at the head.] *Trans. Clifton Coll. Sci. Soc.* vol. ii. pt. ii. pp. 63–70.

Describes the structure of *Eozoön* and the growth of corals.

Wood, Rev. H. H. Notes on some Cornbrash Sections in Dorset. *Proc. Dorset Field Club,* [vol. i.] pp. 22–27.

Remarks on the fauna of the Cornbrash generally.

Wood, S. V. [New occurrences of Mollusca from the Upper Tertiaries.] Note (pp. 119–121) to Paper by **S. V. Wood, Jun.**, and **F. W. Harmer**: see p. 43.

Gives notes of fossils from the Red and Coralline Crags and from Glacial and Post-Glacial deposits. Describes as new species *Murex Reedii* and *Chemnitzia semistriata* from the Coralline Crag. W. T.

Wood, S. V. A Monograph of the Eocene Bivalves of England. Vol. I. Suppl. pp. 1-24, pls. A & B. *Pal. Soc.*

Most of the species described belong to the genera *Cyclas* and *Cyrena*; and the following species are new—*Cyrena strigosa*, *C.* ? *pullastra*, *C. anceps*, *C. tumida*, *C. tenera*, *Cyclas tumidula*, and *Scrobicularia Dulwichiensis*. H. A. N.

——. A Monograph of the Eocene Cephalopoda and Univalves of England. Vol. i. pp. 331-361, pl. xxxiv. *Pal. Soc.*

The following new species are described—*Helix Morrisii*, F. E. Edw., *Callia* ? *lævis*, F. E. Edw., *Pomatias lamellosus*, F. E. Edw., *Bulimus convexus*, F. E. Edw., *B.* (*Pomatias*) *vectiensis*, F. E. Edw., *Neritina Forbesi*, and *N. zonula*. H. A. N.

Woods, Rev. J. E. T. Notes on the Tertiary Fossils of Table Cape, Tasmania. *Proc. R. Soc. Tasm.* for 1876, pp. 91-116.

Describes as new sp. of Gasteropoda, *Murex Eyerei*, *Cassis sufflatus*, *Fusus Tateanus*, *F. transeanus*, *F. Johnstonii*, *Voluta M'Coyi*, *Terebra additioides*, *Astralium Flindersii*, *A. ornatissimum*, *Delphinula tetragonostoma*, *Zizyphinus Blaxlandii*, *Liotia lamellosa*, *Margarita Kekwickii*, *Trochus Josephi*, *Thalotia alternata*, *Solarium gibbuloides*, *Gibbula crassigranosa*, *G. æquisulcata*, *G. Clarkei*, *Turbo Etheridgei*, *Turritella Warburtonii*, *T. Sturtii*, *Tenagodus occlusus*, *Vermetus conohelix*, *Rissoa Stevensiana*, *Rissoina varicifera*, *R. Johnstoni*, *R. Tateana*, *Turbonilla pagoda*, *T. liræcostata*, *Actæon scrobiculatus*, *Emarginula transenna*, *Pleurotoma pullulascens*, *P. sandleroides*, *P. paracantha*, *P. Johnstoni*, *Daphnella columbelloides*, *D. gracillima*, *D. tenuisculpta*, *Mangelia gracilirata*, *Buccinum fragile*, *Triton minimum*, *Cominella cancellata*, *C. lyræcostata*, *Thalia marginata*, *Marginella octoplicata*, *M. strombiformis*, *M. Wentworthii*, *Columbella cainozoica*, *C. Oxleyi*, *Natica vixumbilicata*; of Pelecypoda, *Nucula tumida*, *Cucullæa cainozoica*, *Leda crebricostata*, *Cardita gracilicostata*, *Lima Bassii*, *Tellina cainozoica*, *Chione propinqua*, *Venus cainozoica*, *Chama lamellifera*; Actinozoa, *Dendrophyllia Duncani*, *Flabellum Duncani*; of Polyzoa, *Buskia* (n. gen.) *typica*. **R. M. Johnston** describes a new Echinoderm, *Micraster Etheridgei*. R. E., Jun.

——. On some New Tasmanian Marine Shells. 2nd series. *Papers & Proc. R. Soc. Tasm.* for 1876, pp. 131-159.

Rissoina concatenata, n. sp., probably occurs fossil in the Tertiary beds of Table Cape.

——. On some Tertiary Australian Polyzoa. *Journ. R. Soc. N. S. Wales*, vol. x. p. 147.

Describes as new species *Eschara cavernosa*, *E. porrecta*, *E. Clarkei*, *E. verrucosa*, *E. rustica*, *E. elevata* (? = *E. monilifera*, Busk), *E. Liversidgei*, *E. oculata*, *E. Tatei*, and *E. Buskii*, *Pustulopora angulata*, *P. corrugata*, and *Tubulipora gambiensis*. R. E., Jun.

Woods, Rev. J. E. T. On a Variety of *Trigonia Lamarkii*. *Proc. Linn. Soc. N. S. Wales*, vol. ii. pt. 2, p. 125.

Describes *T. Lamarkii*, var. *reticulata*, which appears in the ornamentation of its shell to be somewhat allied to an Australian Tertiary species, *T. acuticostata*. R. E., Jun.

——. The Echini of Australia (including those of the "Chevert Expedition"). *Proc. Linn. Soc. N. S. Wales*, vol. ii. pt. 2, pp. 145–176.

There is not much connexion between the Australian Tertiary and the Recent Echini; only a few species and genera are common to the two. R. E., Jun.

Woodward, Dr. Henry. A Catalogue of British Fossil Crustacea, with their Synonyms and the Range in Time of each Genus and Order. Pp. xii, 155. 8vo. *London* (British Museum).

A short Introduction shows the range in time of the various orders and subdivisions, and gives a list of the principal works referred to. The Catalogue is zoologically arranged, the synonymy of each genus and species given, the geological distribution of each genus, and the chief localities of every species. It notes 197 genera and 1051 species and varieties. There is a short preface by **G. R. Waterhouse.** R. E., Jun.

[——.] Note on the Genus *Anthrapalæmon* (*Palæocarabus*) of Salter, from the Coal-Measures. *Geol. Mag.* dec. ii. vol. iv. pp. 55, 56.

On the Identity of *Anthrapalæmon* and *Palæocarabus*.

Young, John. [Remarks on] Specimens Exhibited. *Proc. Nat. Hist. Soc. Glasgow*, vol. iii. part ii.

Pp. 102, 103, 125, 126, 177. Siliceous sponge-spicules from Ayrshire Carboniferous Limestone. *Acanthospongia Smithii* and *Hyalonema parallelum* are briefly described. Traces of manganese occur in the deepest rock.

Pp. 169, 170. Corals from the same locality. W. H. D.

——. Notes on an Adherent form of *Productus*. *Proc. Nat. Hist. Soc. Glasgow*, vol. iii. part ii. pp. 175, 176.

Notice of paper by R. Etheridge, Jun., on this subject. (See Geological Record for 1876, p. 274.)

Young, Prof. J., and John Young. On a Carboniferous *Hyalonema* and other Sponges from Ayrshire. *Annals*, ser. 4, vol. xx. pp. 425–432, pls. xiv., xv.

Give the name *Hyalonema Smithii* to a siliceous sponge from the Carboniferous rocks of Scotland, and fully describe its organization. *Haplistion* (n. gen.), with the single new species *H. Armstrongi*, is founded for the reception of massive, spheroidal, Carboniferous sponges, the texture of which is siliceous, though it is not certain that they were originally siliceous. The name *Chlamys magna* is given to certain gigantic spicules from the Carboniferous rocks of Ayrshire, which indicate a species of the group *Gummina*. A number of undetermined

forms are noted and figured; and the geological position of the sponges is discussed. **H. A. N.**

Young, Prof. J., and John Young. A new Species of *Sulcoretepora.* *Proc. Nat. Hist. Soc. Glasgow,* vol. iii. part ii. pp. 166–168, pl. i.

Describe *Sulcoretepora Robertsoni* from L. Carboniferous Limestone Shale, Ayrshire.

Zittel, Prof. K. A. Beiträge zur Systematik der fossilen Spongien. [Systematic Arrangement of Fossil Sponges.] *N. Jahrb.* pp. 1–40; 2 pls. Translated in *Ann. Nat. Hist.* ser. 4, vol. xx. pp. 257–273, 404–424, 501–517.

Almost exclusively occupied with the Hexactinellidæ. Amongst general considerations, it is stated that the silica of the original skeleton of the sponge is often replaced by carbonate of lime. Divides the Hexactinellidæ into the groups of *Lyssakina,* in which the spicules are, as a rule, isolated and only united by sarcode, and *Dictyonina,* in which the spicules are fused and form a coherent network with quadrate or polyhedral meshes. Concludes with descriptions and definitions of the genera of fossil and recent Hexactinellidæ. *Trematodictyon, Craticularia, Sphenaulax, Sporadopyle, Leptophragma, Pachyteichisma, Trochobolus, Schizorhabdus, Rhizopoterion, Polyblastidium, Stauroderma, Ophrystoma, Tremabolites, Toulminia, Callodictyon, Marshallia, Pleurope, Diplodictyon,* and *Stauractinella* are described as new genera. Some new species are named but not described. **H. A. N.**

Catalogue of the Brachiopoda of the Lothians and Fife. Prepared by the Society's Lothians and Fife Palæontological Committee. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 68–87.

A general Introduction by **T. Davidson** on the Class, and another on the Carboniferous genera only by **A. Somervail,** containing a few stratigraphical remarks, occupy pp. 68–81. 28 U. Silurian and 44 Carboniferous species are catalogued, with references to Davidson's Monograph and to localities. **W. H. D.**

Sinopsis Palæontologica de España. [Synopsis of Spanish Palæontology.] Pls. 11, 12, 17, 23–30, 34–38. *Bol. map. geol. Esp.* t. iv.

Drawings of 24 species of Devonian and 41 species of Carboniferous fossils, all invertebrate.

See also:—

Blake, Rev. J. F. Restoration of Extinct Animals: p. 278.

Boeckh, J. New Eocene Fossils, Bakony: p. 55.

Boehm, G. New Neocomian Fossils, Germany: p. 55.

Burgerstein, Dr. L. New U. Tertiary Fossils, Macedonia: p. 57.

Butler, F. H. Echinodermata. *Encyclopædia Britannica*: at end of MISCELLANEOUS.

Dairon, J. New Graptolites, Dumfriesshire: p. 8.

Dollfus, G. New *Cytheridea*, Eocene, Dieppe: p. 60.

Fontannes, F. Tertiary Fossils, Rhone Valley: p. 107.

Gosselet, Prof. J. New Devonian Fossils: p. 69.

Johnston, —. New *Pleurotomaria*, Tasmania: p. 160.

Lartet, —. Cretaceous Fossils, Palestine: p. 142.

Loriol, P. de. Valangian Echinodermata: under **Harpe**, p. 71.

Michelotti, G. Palæozoic Fossils, Alps and Apennines: under **Gastaldi**, p. 66.

Nicholson, Prof. H. A. Corals and Cuttlefishes. *Encyclopædia Britannica*: at end of MISCELLANEOUS.

Russell, J. C. Footprints: p. 292.

Toula, F. New Sarmatian Fossils, W. Balkans: p. 99.

Vidal, L. M. New Cretaceous Fossils, Catalonia: p. 101.

Woodward, H. Crustacea. *Encyclopædia Britannica*: at end of MISCELLANEOUS.

Also the references under "Lists of Fossils" in the GENERAL INDEX.

SUPPLEMENT FOR 1874–1876.

Alth, Dr. Alojzy. Rzecz o belemnitach Krakowskich. [Cracow Belemnites.] *Sprawozd. Kom. Fizyjogr. Krakow*, t. x. pp. 212–237, pls. iii., iv. [1875.]

Describes and figures *Belemnites Majeri*, n. sp., and others previously known.

Barrett, Dr. S. T. Description of a new Trilobite, *Dalmanites dentata.* *Amer. Journ.* ser. 3, vol. xi. p. 200, pl. vii. See also vol. xii. pp. 70, 71 (additional note). [1876.]

From the upper compact beds of the *Delthyris* shale (L. Helderberg), Port Jervis, Orange Co., N. York.

Brocchi, P. Note sur une nouvelle espèce Crustacé fossile (*Penæus libanensis*). [New Crustacean.] *Bull. Soc. Géol. France,* sér. 3, t. iii. pp. 609, 610, pl. xxi. [1876.]

From U. Cretaceous, Mt. Lebanon.

Brusina, Spiridion. Cenno sugli studj naturali in Dalmazia seguito dalla descrizione di alcuni fossili terziari. [Tertiary Fossils, Dalmatia.] *Zara.* [1875.]

Carpenter, Dr. W. B. Final Note on *Eozoon canadense.* *Annals,* ser. 4, vol. xiv. pp. 371, 372. [1874.]

Conrad, T. A. Description of the genus *Haploscapha* and subgenus *Cucullifera,* together with the species *H. grandis* and *H.* (*C.*) *excentrica.* Pp. 23, 24, and 2 pls. of Prof. Cope's "Vertebrata of the Cretaceous Formations of the West," noticed in the GEOLOGICAL RECORD for 1875, p. 274.

——. Notes on the genus *Catillus,* Brong. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. v. pp. 466, 467. [1875.]

Proposes *Haploscapha* in place of *Catillus* (preoccupied).

Cotteau, Gustave. Paléontologie Française. Sér. 1. Animaux Invertébrés. Terrain Jurassique. Livr. 35, 36. Echinodermes réguliers. [Jurassic Echinoderms.] Pp. 97–176, pls. 167–190. [1876.]

The following species appear to be new:—*Cidaris variegata, C. Chalmasi, C. trouvillensis,* and *C. silicea.*

——. Etudes sur les Echinides Fossiles du département de l'Yonne. Livr. 36–39, vol. 2. Terrain Crétacé. Pp. 251–350, pls. 71–75. 8vo. *Paris.* [1876.]

Describes and figures, with other Cretaceous fossils already known, the following new species from the Turonian beds—*Holaster icaunensis* and *H. æquituberculatus.* J. D.

——. Note sur les Echinides crétacés de la province du Hainaut. [Cretaceous Echini of Hainault.] *Bull. Soc. Géol. France,* sér. 3, t. ii. pp. 638–660, pls. xix., xx. [1876.]

Remarks on 48 species. *Cyphosoma Corneti* and *Pyrina Houzeaui* only are new; but many others are redescribed.

Credner, Prof. H. Marine Conchylien des Mitteloligocän im Königreiche Sachsen. [Marine Shells of M. Oligocene, Saxony.] *Sitz. nat. Ges. Leipzig,* p. 16. [1876.]

Dawson, Dr. J. W. Impressions and Footprints of Aquatic Animals and Imitative Markings on Carboniferous Rocks. *Canad. Nat.* n. ser. vol. vii. pp. 65–74. [1874.]
Reprinted from *Amer. Journ.* ser. 3, vol. vi.

——. On some new specimens of fossil Protozoa from Canada. *Proc. Amer. Assoc.* vol. xxiv. pp. 100–105. [1876.]
General description and figure of *Eozoön canadense* and Cretaceous Foraminifera.

——. New Facts relating to *Eozoön canadense. Proc. Amer. Assoc.* vol. xxv. pp. 231–234. [1876.]

Dechen, H. von. Ueber einen fossilen Krebs aus dem Rupelthon des Mainzer Beckens. [Crab from Rupelian Clay, Mayence Basin.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. i. *Sitzungsb.* p. 79. [1874.]

Derby, O. A. Notice of the Palæozoic fossils of Lake Titicaca. *Bull. Mus. Comp. Zool.* vol. iii. pp. 279–286. [1876.]

Dybowski, W. Beschreibung einer permischen Koralle (*Fistulipora Lahuseni*, n. sp.). [Description of a New Permian Coral.] 8vo. *St. Petersburg.* [1876.]

——. Ueber die Gattung *Stenopora*, Lonsdale, mit besonderer Berücksichtigung der *Stenopora columnaris*, Schloth., n. sp. [On *Stenopora.*] 8vo. *St. Petersburg.* [1876.]

——. Beitrag zur Kenntniss der inneren Structur von *Cystiphyllum* (*Microplasma*) *impunctum*, Lonsd. [Internal Structure of *C. impunctum.*] Pp. 12. *St. Petersburg.* [1876.]

Etheridge, R. Jun. Notes on Carboniferous Lamellibranchiata. *Annals*, ser. 4, vol. xviii. pp. 96–105, pl. iv. [1876.]
The following are described as new species—*Aviculopecten subconoideus, Leda Traquairii, Leptodomus? clavatus, Myalina? trigonalis, Nucula Youngi.* R. B. N.

Filhol, H. Sur les Coquilles fossiles des dépôts de Phosphate de Chaux du Quercy. [Mollusca of the Quercy Phosphate-beds.] *Bull. Soc. Philomat. Paris*, sér. 6, t. xiii. pp. 64, 65. [1876.]
List of 29 land and freshwater shells, showing the deposit to be U. Eocene.

Frič, Dr. Anton. Fauna der Steinkohlenformation Böhmens. [Carboniferous Fauna of Bohemia.] *Arch. nat. Land. Böhm.* Bd. ii. pp. 1–16. [1874. Ed. 2 in 1876.]
Describes *Gampsonychus parallelus* recorded (but not described) by Krejči in *Lotos,* 1859, and other Articulata.

Gemmellaro, Prof. G. G. Sopra alcune Faune Giuresi e Liasiche di Sicilia. Studi Paleontologici. [Jurassic and Liassic Fauna of Sicily.]

Fasc. 1 and 2, published in 1873, in *Atti Ac. Gioen. Sci. Nat.*, and *Giorn. Sci. Nat. Econ. Palermo* respectively, deal with Liassic fossils.

Fasc. 3. Sopra i fossili della zona con *Terebratula Aspasia*, Menegh. della provincia di Palermo e di Trapani. Pp. 53–112, pls. x.–xii. *Giorn. Sci. Nat. Econ. Palermo*, vol. x. pp. 60; 3 pls. [1874.]

The new species are *Leptæna gibbosula*, *Spiriferina statira*, *S. sicula*, *Terebratula rudis*, *T. Taramellii*, *Waldheimia Catharineæ*, *W. securiformis*, *Kingena Josephinia*, *Rhynchonella Reynesi*, *R. pusilla*, *R. Orsinii*, *R. Briseis*, *R. Zitteli*, *R. Glycinna*, *Placunopsis Zitteli*, *Pecten Stoliczkai*, *P. Ponzii*, *P. agathis*, *Lima Liasina*, *Pleurotomaria Scacchii*, *P. trochotomopsis*, *Trochus Scherinus*, *Chemnitzia sinistrorsa*, *Phylloceras Meneghinii*, *Harpoceras Scherinum*.

Fasc. 4–7, noticed above, p. 310. R. B. N.

Hauer, Fr. v. Sammlung von Nummuliten aus Ungarn. [Hungarian Nummulites.] *Verh. k.-k. geol. Reichs.* pp. 161, 162. [1876.]

Hébert, Prof. E. Description de deux espèces d'*Hemipneustes* de la Craie supérieure des Pyrénées. [2 *Hemipneustes* from U. Chalk of Pyrenees.] *Bull. Soc. Géol. France*, sér. 3, t. iii. pp. 592–595, pls. xix., xx. [1876.]

H. pyrenaicus and *H. Leymeriei*; neither new species.

Hinde, George J. Description of a new genus of Tabulate Coral. *Quart. Journ. Geol. Soc.* vol. xxxi., *Proceedings*, p. lxxxvii. [1875.]

Sphærolites Nicholsoni (n. gen. & sp.), from the L. Helderberg of New Brunswick.

Hyatt, Prof. Alpheus. Genetic Relations of the Angulatidæ. [Ammonites.] *Proc. Boston Soc. Nat. Hist.* vol. xvii. pp. 15–23. [1874.]

——. Appendix to communications on reversions among the Ammonites. *Proc. Boston Soc. Nat. Hist.* vol. xvii. pp. 23–28. [1874.]

Additions to a paper in vol. xiv. p. 22 (1870).

——. Appendix to communication on "The non-reversionary series of the Liparoceratidæ." *Proc. Boston Soc. Nat. Hist.* vol. xvii. pp. 29–33. [1874.]

Additions to a paper in vol. xv. p. 4 (1872).

——. Genetic relations of *Stephanoceros*. *Proc. Boston Soc. Nat. Hist.* vol. xviii. pp. 360–400. [1876.]

Divides Waagen's genus into 11 sections, describing 23 species, their range through the Jurassic rocks being shown by a table.

Issel, Prof. Arturo. Appunti Paleontologici. I Fossili delle Marne di Genova. [Fossils of the Genoa Marls.] *Ann. Mus. Nat. Genova*, t. ix. (in two parts), pp. 56. [1876.]

Loriol, P. de. Note sur l'*Holaster lævis* (De Luc), Agassiz. *Bull. Soc. Géol. France*, sér. 3, t. iii. pp. 555–567. [1876.]

Regards *H. lævis*, *H. nodulosus*, *H. marginalis*, *H. Sandoz*, and *H. Trecensis* as one species.

Mallada, Lucas. [The remaining 12 plates of the paper on Spanish Fossils noticed in Geological Record for 1875, p. 315.] *Bol. Com. map. geol. Españ.* t. iii. [1876.]

The species mentioned in the notice are all Carboniferous: add *Bronteus Castroi*, Devonian.

Meek, T. B. New genus, *Euchondria*, Meek. *Amer. Journ.* ser. 3, vol. vii. p. 445. [1874.]

Proposes this new genus to receive *Pecten neglectus*.

Meneghini, J. Monographie des fossiles appartenant au Calcaire rouge ammonitique de Lombardie et de l'Apennin de l'Italie Centrale. [Fossils of the U. Lias Limestone, Lombardy, and Central Italy.] *Paléontologie Lombarde*, sér. 4, livr. 7, 8, pp. 81–104, pls. xvii.–xx. [1875, undated], livr. 9, pp. 105–112, pls. xxi., xxii. [1876, undated.]

The following new species, from Medolo, are described:—*Ammonites* (*Phylloceras*) *selinoides*, *A.* (*P.*) *Ausonius*, *A.* (*P.*) *Spadæ*, *A.* (*P.*) *Bicicolæ*, *A.* (*P.*) *Stoppanii*, *A.* (*Lytoceras*) *Villæ*, *A.* (*L.*) *Cereris*, *A.* (*L.*) *velifer*, *A.* (*L.*) *Dorcadis*, *A.* (*L.*) *sepositus*, and *A.* (*L.*) *spirorbis*.
J. P. D.

Nicholson, Prof. H. A. On the Species of *Favosites* of the Devonian Rocks of West Ontario. *Canad. Journ.* vol. xiv. pp. 38–50. [1874.]

——. On the genera *Conchicolites* and *Ortonia*. *Cincinn. Quart. Journ. Sci.* vol. i. pp. 263–238. [1874.]

Reply to editorial criticism (S. A. Miller).

Olszewsky, Dr. Stanislaw. Zapiski Paleontologiczne. [Palæontological Notes.] *Sprawozd. Kom. Fizyjogr. Krakow*, t. x. pp. 95–149, pls. i., ii. [1875.]

Describes and figures the following new species—*Nodosaria sceptriformis*, *N. pauperculoides*, *N. tenuis*, *N. adtenuens*, *N. marginula*, *Glandulina lagenoides*, *Frondicularia elongata*, *Cristellaria althi*, *C. bistegia*, *C. carinata*, *Polymorphina simplex*, *P. adhærens*, *P. acuta*, *Bulimina frons*, *Discorbina leopolitana*, *Polystomella* (D'Orb.) *Karreri*, *Haplostiche depressa*, *Verneuillina convexa*, *Plecanium depressum*, and *Heterostomella leopolitana*, besides many previously known species. All are Cretaceous.
W. H. D.

Penny, Rev. C. W. Natural History in the Christmas Holidays. *4th Ann. Rep. Wellington Coll. Nat. Sci. Soc.* pp. 42–45. [1874.]

Remarks on *Rhynchonella*, *Terebratula*, *Belemnites*, *Ammonites*.

Piette, —. Paléontologie Française. Sér. i. Animaux invertébrés. Gastéropodes. Tom. iii. Terrain Jurassique. livr. 32–34. [Jurassic Gasteropods.] Pp. 193–336, pls. xlix.–lxxxiv. [1876.]

The following species seem to be new—*Chenopus*? (*Monocuphus*?) *jucundus*, *C.* (*M.*?) *pulcher*, *C. arenaceus*, *C. amœnus*, *C.*? *alternans*, *C. vegetus*, *C. magnificus*, *C. Etalloni*, *C. gemmatus*, *C. modestus*, *C. ovatus*, *C. varicosus*, *C.*? *Valtensis*, *C. mammosus*, *C. Perroni.* J. P. D.

Ponzi, G. Lavori degli Insetti nelle ligniti del Monte Vaticano. [Insects of the Mt. Vatican Lignite.] Pp. 3. 4to. *Rome.* [1876.]

——. I fossili del Monte Vaticano. [Fossils of Mt. Vatican.] Pp. 37; 3 pls. 4to. *Rome.* [1876.]

Quenstedt, Prof. F. A. Petrefaktenkunde Deutschlands. Bd. iv. Echinodermen. [German Echinodermata.] Lief. 11. Encriniden. Pp. 433–560, pls. 106–109 (in folio atlas). 8vo. *Leipzig.* [1875.] Lief. 12. Encriniden, Cystideen, Blastoideen. Pp. 560–727, pls. 109–114. Index of species (for volume), pp. 728–742. [1876.]

Continuation of the work noticed in GEOLOGICAL RECORD for 1875, p. 321 (of which pp. 1–96, pls. 90–93, were published in 1874).

Rutot, A. Relation au point de vue Paléontologique de l'Excursion entreprise les 1^{er} et 2^{e} août 1875 aux Environs de Namur.... [Palæontological Report of the Namur Excursion.] *Bull. Soc. Mal. Belg.* t. x. *Mém.* pp. 102–110. [1876.]

Notes on the fauna of recent travertine, of Carboniferous, and of Devonian Rocks.

Sauvage, Dr. E. Note sur les Astéries du terrain jurassique supérieur de Boulogne-sur-Mer. [U. Jurassic *Asteriæ* of Boulogne.] *Bull. Soc. Acad. Boulogne,* t. ii. p. 21. [1874.]

Schlüter, C. Das Vorkommen von *Belemnitella mucronata* in Quadratenkreide von Asterfeld, sowie des *Pygurus rostratus* im Senonen-Quader von Blankenburg; über Belemniten von Arnager auf Bornholm; über *Ammonites Lüneburgensis* in der Schreibkreide Danemarks. [Cretaceous Belemnites, &c. Germany and Denmark.] *Verh. nat. Ver. preuss. Rheinl.* Folg. 4, Bd. i. *Sitzungsb.* pp. 257–261. [1874.]

——. Ueber die Gattung Turrilites und die Verbreitung ihre Arten in der mittleren Kreide Deutschlands. [German M. Cretaceous *Turrilites.*] *Verh. niederrh. Ges. Bönn,* p. 27. [1875.]

Describes 17 species, of which 6 are new:—*T. Börssumensis*, *T.*

alternans, and *T. Cenomanensis*, from the Cenomanian; *T. tridens*, *T. varians*, and *T. undosus* from the Ems Marl (Senonian). W. H. D.

Schultze, Max. *Eozoön canadense.* *Annals*, ser. 4, vol. xiii. pp. 324–326. Translated from *Kölner Zeitung*, Aug. 14, 1873. Report of Meeting of the Niederrheinisch Gesellschaft für Natur- und Heilkunde. [1874.]

Concludes that there can be no serious doubt as to the foraminiferous nature of *Eozoön.*

Scudder, S. H. New and Interesting Insects from the Carboniferous of Cape Breton. *Canad. Nat.* n. s. vol. viii. pp. 88–90; *Proc. Amer. Assoc.* vol. xxiv. pp. 110, 111. [1876.]

Describes and figures *Libellula carbonaria* and *Blattina sepulta*, both new species.

Shaler, Prof. N. S. [Brachiopoda of the Ohio Valley.] *Mem. Geol. Surv. Kentucky*, vol. i. [1876.]

Sintzof, —. [Remarks on *Belemnites Zitteli.*] *Zapiski Novoruss. Obsch. Estest.* t. iv. fasc. 1. [1876.]

Sordelli, F. La fauna marina di Cassina Rizzardi. [Marine Fossils (of Glacial Beds), Como District.] *Atti Soc. Ital. Sci. Nat.* vol. xviii. p. 308.

Spreafico, E. Conchiglie marine nel Terreno Erratico di Cassina Rizzardi, presso Fino nella Provincia di Como. [Marine Shells in Drift, in Como.] *Atti Soc. Ital. Sci. Nat.* vol. xvii. p. 432. [1875.]

Stache, Dr. G. Die Fauna der Bellerophonkalke Südtirols. [Bellerophon Limestone of S. Tyrol.] *Verh. k.-k. geol. Reichs.* pp. 257–261. [1876.]

Remarks on the characteristic Invertebrata.

Stearns, R. E. C. Descriptions of New Fossil Shells from the Tertiary of California. *Proc. Ac. Nat. Sci. Philadel.* for 1875, pp. 463, 464, pl. 27. [1876.]

Describes and figures *Scalaria* [*Opalia*] *varicostata* and *O. anomala.*

Stefani, De. Descrizione delle nuove specie di molluschi pliocenici raccolti nei dintorni di S. Miniato di Tedesco. [New Pliocene Fossils, Italy.] *Bull. Soc. Mal. Ital.* vol. i. [1875.]

——. Descrizione di nuove specie di molluschi pliocenici Italiani. *Bull. Soc. Mal. Ital.* vol. i. [1875.]

These were confounded as one in the GEOLOGICAL RECORD for 1876, p. 363.

Trautschold, H. Die Kalkbrüche von Mjatschkowa. Eine Monographie des oberen Bergkalks. [The Limestones near Moscow.

A Monograph of the U. Mountain Limestone.] *Mém. Soc. Imp. Nat. Mosc.* t. xiii. livr. 5, p. 325. [1876.]

In addition to a large number of already known species of Carboniferous fossils, the following are described as new—*Spirifer tegulatus, S. angustivolvatus, Polypora irregularis, Ascopora* (n. gen.), *A. rhombifera, Ceriopora inæquabilis.* There is also figured, but not described, *Ceriopora cincta.* R. E., Jun.

Vanden Broeck, E. Quelques considérations au sujet d'un travail de M. Davidson, sur les Térébratules des terrains tertiaires de la Belgique. [Remarks on Davidson's Memoir on the Tertiary Terebratulæ of Belgium.] 8vo. *Brussels.* [1874.]

Vincent, G. Note sur quelques Scalaries Eocènes des Environs de Bruxelles. [Eocene *Scalariæ* of Brussels.] *Ann. Soc. Mal. Belg.* t. x. *Mém.* pp. 87–96, pl. vii. [1876.]

Shows the range of 18 species in L. and M. Eocene, describing as new and figuring *S. Servaisi*, from Paniselian, and *S. tenuicosta*, Bruxellian, and redescribing as *S. curvilamella* a shell regarded in 1871 as *S. affinis*, from the Lackenian. W. H. D.

——. Note sur les trois Coquilles Fossiles du Terrain Laekénien des Environs de Bruxelles. [3 Laekenian Shells, Brussels.] *Ann. Soc. Mal. Belg.* t. x. *Mém.* pp. 123–127, pl. ix. [1876.]

Describes and figures *Pecten nitidulus, Pleurotoma Heberti,* and *Triton fusiforme,* the last being new.

Walcott, C. D. Description of a new species of Trilobite. *Cincinn. Quart. Journ. Sci.* vol. ii. pp. 273, 274. [1875.]

Sphærocoryphe robustus from L. Silurian.

——. New species of Trilobite from the Trenton Limestone, at Trenton Falls, N.Y. *Cincinn. Quart. Journ. Sci.* vol. ii. pp. 347–349. [1875.]

Remopleurides striatulus.

Williamson, Prof. W. C. The Dawn of Animal Life. (Glasgow Science Lecture.) 8vo. *London* and *Glasgow.* Price 3*d.* [1875.]

3. *PLANTS.*

[Through an unforeseen delay with the MS., this section has been printed at the end, p. 369.]

MAPS AND SECTIONS.

Sub-Editor H. B. Woodward, F.G.S.

Austria. Atlas der Urproduction Oesterreichs. Die Bergwerks-Production Oesterreichs. 1857–1876. 10 Maps. By **A. Schauenstein.** *Vienna.* [1877 ?]
Mineral statistics.

Belgium. Carte géologique de Belgique. By **Houzeau de Lehaye.** *Brussels.*

The Scaldisian, Diestian, and Bolderian are grouped together as Pliocene. The boundaries of the Antwerp and Diestian sands are shown by coloured lines and dots.

Colchester. Artesian Well made at C. Stopes and Sons' Eagle Brewery, Colchester. By **H. Stopes.** Privately printed. Vertical scale 8 feet to an inch.
Through Drift, London Tertiaries, and Chalk.

Colorado and Portions of Adjacent Territories. Geological and Geographical Atlas. By **Dr. F. V. Hayden.** *United States Geological and Geographical Survey of the Territories.* 20 maps. Elephant fol. *Washington.*

Nos. 1, 2, 5–10 are Topographical, covering the same ground as the Geological maps; 3, Economic (Coal, Gold, Silver); 4, General Geology (Quaternary, Tertiary, Post-Cretaceous, Cretaceous, Jura-Trias, Carboniferous, Silurian, Metamorphic, and Igneous), these two on the scale of 12 miles to an inch; the following maps on the scale of 4 miles to an inch:—

11. N.W. Colorado and Part of Utah: Alluvium, Tertiary (4 groups), Post Cretaceous (Laramie), Cretaceous (5 divisions), Jura-Trias (2 divisions), Carboniferous (3 divisions), Silurian, Archæan, and Eruptive Rocks (3 kinds).—12. N. Central Colorado: Quaternary (4 divisions), Tertiary (2 groups), Post Cretaceous, Mesozoic, and Palæozoic as Sheet 11, Eruptive Rocks (5 kinds).—13. Central Colorado: Quaternary (4 divisions), Tertiary (2 groups), Post Cretaceous, Mesozoic, and Palæozoic as Sheet 11, Eruptive Rocks (8 kinds).—14. W. Colorado and Part of Utah: Quaternary (2 divisions), Tertiary (2 groups), Post Cretaceous (Laramie), Cretaceous (6 divisions), Jura-Trias (2 divisions), Carboniferous (3 divisions), Silurian, Archæan (2 divisions), Eruptive Rocks (7 kinds).—15. S.W. Colorado and Parts of New Mexico, Arizona, and Utah: Quaternary (2 divisions), Tertiary (Wahsatch), Post Cretaceous and Mesozoic as Sheet 14, Carboniferous (U. and M.), Devonian, Silurian, Archæan (2 divisions), Eruptive Rocks (4 kinds).—16. S. Central Colorado and Part of New Mexico: Quaternary (5 divisions), Tertiary (2 groups), Post Cretaceous and Mesozoic as Sheet 11, Carboniferous (U. and L.), Archæan, Eruptive Rocks (5 kinds). Gold, silver,

and thermal springs are marked on these maps.—17, 18. **Sections:** Horizontal Scale 21,170 feet to an inch; Vertical Scale 20,000 feet to an inch.—19, 20. Panoramic Views, geology indicated. W. H. D.

England and Wales. 2 Quarter Sheets of the *Geological Survey Map*. Scale an inch to a mile. Price 3*s*. each.

Sheet 87, N.W. (Wakefield, Pontefract, Kippax.) By **W. T. Aveline,** [Prof.] **A. H. Green, R. Russell,** and **T. V. Holmes.** Shows Alluvium, Permian, and Carboniferous.

Sheet 98, S.W. (Ulverston, Broughton in Furness.) By **W. T. Aveline** and **A. C. G. Cameron.** Alluvium, Blown Sand, Permian, Carboniferous, U. and L. Silurian, Granite, Igneous Dykes. H. B. W.

——. 6 Sheets of the "Horizontal Sections" of the *Geological Survey*. Scale 6 inches to a mile. Price 5*s*. each.

Sheet 114. Section from the Carboniferous Limestone near Scales Moor; across the Skiddaw Slate of Owsen Fell, Blake Fell, and Gavell Fell; the Syenitic Granite of Ennerdale; the Volcanic Rocks of Pillar and Kirk Fell: the Granite of Wastdale Head, and the Volcanic Rocks of Scafell Pikes, of the heads of Eskdale and Duddon Dale, Cumberland; Grey Friars, Coniston Old Man, and the Coniston Limestone, Stockdale Slates, Coniston Flags and Grits, to the Bannisdale Slates east of Coniston Water, Lancashire. By **W. T. Aveline, J. C. Ward, R. Russell,** and **E. J. Hebert.**

Sheet 115. Section from the Carboniferous Limestone N. of Cockermouth, through the Skiddaw Slate series of Elva Hill, Ling Fell, Whinlatter, Grisedale and Causey Pikes, and the Volcanic Series of Borrowdale, the Plumbago Mines, the Volcanic Rocks of Base Brown, Allen Crags, Bow Fell, Pike of Bliscoe, Wrynose, and Wetherlam, to the Coniston Limestone (Lower Silurian), and through the Coniston Flags and Grits and Bannisdale Slates (Upper Silurian) S.E. of Coniston Lake. By **W. T. Aveline, J. C. Ward, C. E. De Rance,** and **E. J. Hebert.**

Sheet 116. Section from the Carboniferous Limestone, 1½ miles E. of Uldale, across the northern margin of Volcanic Rocks, through the Slate and Grit beds of Great Cockup, the Metamorphosed Slate of Skiddaw, the Dolerite of Castle Head, Keswick, the Volcanic Series of Wallow Crag, Bleaberry and Watendlath Fells, Ullscarf, Cumberland; Great and Little Langdale, Westmorland, to the Coniston Limestone, Stockdale Slates, and Coniston Flags near Water Head House, Coniston, Lancashire. By **W. T. Aveline, J. C. Ward,** and **C. E. De Rance.**

Sheet 117. Section from the Carboniferous Limestone, 2½ miles S.W. of Caldbeck, across the Volcanic Rocks north of the Roughton Gill Mines, the Granite and Metamorphic Rocks of Skiddaw Forest, the Skiddaw Slates of Blencathra, the Quartz Felsite of the Vale of St. John, and the Volcanic Series of the Helvellyn range of Grasmere and Rydal, and of Loughrigg, to the Coniston Limestone and Coniston Flags and Grits west of Windermere Lake. By **J. C. Ward, C. E. De Rance,** and **E. J. Hebert.**

Sheet 118. Section from the Carboniferous Limestone, South of Hesket Newmarket, Cumberland, through the Northern fringe of Volcanic Rocks, Carrock Fell, the Skiddaw Slate of Mungrisdale, the Conglomerate of Mell Fell, the Volcanic Rocks of Gowbarrow, the Skiddaw Slates of Ullswater; and the Volcanic Rocks of Martindale Common, Caudale Moor, and Ill Bell, to the Coniston Limestone, Stockdale Shales, and Coniston Flags of Kentmere Park, Westmorland. By **W. T. Aveline, J. C. Ward, and E. J. Hebert.**

Sheet 120. Section of the London Basin from South to North; from the Chalk, S.E. of Farningham, Kent, across the Tertiary Outlier of Swanscomb Park Wood and the Valley of the Thames before Greenhithe; through Essex, from West Thurrock, across the Bagshot Outlier of Warley Common, the Valley of the Roding, Epping Plain, and the Valley of the Stort above Roydon, into Hertfordshire, to the outcrop of the Chalk in the Valley of the Ash at Widford. By **W. Whitaker** and **W. H. Penning.** H. B. W.

England and Wales. Sheet 62 of the "Vertical Sections" of the *Geological Survey.* Scale 40 feet to an inch. Price 3*s.* 6*d.*

Sections of Lead Mines in the Carboniferous Limestone Series of Northumberland, in the Districts of the Tyne, Allendale, and Derwent. No. 1. Shildon Mine, Engine Shaft. 2. Beldon Mine, Pumping Shaft. 3. Allenheads Mine, Collier and High Shafts. 4. Blackett Level, Breckon Hill Shaft. 5. Blackett Level, Sipton Shaft. 6. Blackett Level, Holms Linn Shaft. 7. Blackett Level, Studdon Dean Shaft. 8. Coalcleugh Mine, Scraithe Hole Shaft. 9. Longcleugh Mine. 10. Waterfall, Whitfield Grounds. 11. Honeycrook Mine, Leadbitter Shaft. 12. Grindon Mine, Engine Shaft. 13. Settlingstones Mine, Winters Shaft. 14. Stonecroft Mine, Greyside Shaft. 15. Carr Edge Mine, West Shaft. 16. Fallowfield Mine. By **D. Burns.** H. B. W.

——. Geological Map of England and Wales. Scale about 11 miles to an inch. By **Andrew C. Ramsay.** Ed. 4. *London.*

Shows Igneous Rocks (3 divisions), Cambrian, L. Silurian, U. Silurian, Old Red Sandstone, Carboniferous (5 divisions), Permian (2 divisions), Trias (2 divisions), Lias, Oolites (4 divisions), Cretaceous (6 divisions), Tertiary (6 divisions). H. B. W.

Filipstad. Karta öfver Jerngrunden inom Filipstads Bergslag eller Fernebo Närad i Vermlands län. By **A. E. Törnebohm.** [Geological Map of Filipstad Iron Ore district in Province Vermland, Sweden.] In two parts. Scale 1 : 80,000. *Stockholm.* [See p. 99.]

Formations:—Dalecarlia sandstone with layers of greenstone schist; Conglomerate; "Eurite-breccia;" Dotted schist; Dark clay-slate, Dark eurite, Quartzite; Granular limestone and dolomite; Light-coloured eurite; Gneiss, grey and red, with layers of amphibole-schist; Gneiss-granite; Hyperite; Hyperite and diabase; Diorite; Gabbro-diorite and Schillerspar; Oligoclase-porphyry; Quartz-orthoclase-porphyry and porphyroid, Fine-grained granite; Syenitic granite; Liljendal granite and Hornkull granite, Coarse-grained granite, Granite with hornblende, Schistose granite. E. E.

France. Carte géologique détaillée de la. 5 Sheets. Scale 1 : 80,000.
Sheet 8. Douai. By **A. Potier.**
Sheet 10. St. Valery. } By **Edmond Fuchs.**
Sheet 11. Abbeville. } By **Edmond Fuchs.** } Tertiary and Cretaceous.
Sheet 95. Orleans. } By **H. Douvillé.** Tertiary, Cretaceous, and
Sheet 109. Gien. } Oolitic. H. B. W.

Heidelberg. Geognostische Karte der Umgegend v. Heidelberg. By **E. W. Benecke** and **E. Cohen.** Scale 1 : 50,000.

Gneiss, Granite, &c., 14 colours; Dyas, 10 divisions (with porphyries, &c.); Trias, 2 divisions; Tertiary; Diluvium, 6 divisions; Recent, 2 divisions; Eruptive rocks, 2 divisions. Contains Heidelberg and the valley of the Neckar to above Hirschhorn, Weinheim. W. W.

Ireland. 4 Sheets of the *Geological Survey Map.* Scale an inch to a mile.

Sheet 34. Part of Tyrone (Ballygawley, Six-mile-cross, Donaghmore, Pomeroy, Castlecaulfield). Includes the edge of the Dungannon coal-field, and the mountainous district east of Omagh. By **J. Nolan** and **E. T. Hardman.** *Formations*:—Peat Bog; Alluvium; Drift; Carboniferous (Yoredale Beds; Upper, Middle, and Lower Limestones; Lower Sandstone); Old Red Sandstone; L. Silurian (Bala Beds); Metamorphic Rocks; Melaphyre, Basalt, and Dolerite; Felstone; Hornblendic and Pyroxenic rocks; Hypersthene rocks; Elvanite, Syenite and syenitic Granite, and Granite. Glacial markings are shown, also Copper and Iron-ores.

Sheet 40. Part of Mayo (N. Coast to Benwee Head and the Stags of Broadhaven). By **W. A. Traill** and **H. Leonard.** *Formations*:—Blown Sand; Bog; Alluvium; Shingle; Drift; Carboniferous (Lower Sandstones and Shales); Metamorphic (Schist and Quartzite); Basalt; Dolerite; Diorite; Felstone. Glacial markings shown, and Copper-ore.

Sheet 41. Part of Mayo (N. Coast, including the mouth of Killala Bay, Downpatrick Head, and Bunatrahir Bay). By **R. G. Symes.** *Formations*:—Blown Sand; Bog; Alluvium; Drift; Carboniferous (L. Limestone and Sandstone); Dolerite Dykes. Glacial markings shown and Copper-ore.

Sheet 94. Part of Galway. Comprises the mountainous district from Lough Corrib (including its W. arm) to Ballinahinch, with the Maumturk and Bennabeola Mountains. By **G. H. Kinahan, J. L. Warren, J. Nolan,** and **H. Leonard.** *Formations*:—Bog; Alluvium; Raised Beaches; Drift; Carboniferous Limestone; U. Silurian (Ludlow, Salrock; Wenlock, Mweelrea; U. Llandovery); L. Silurian, Metamorphic, Mica-schist, Hornblende-schist, Quartzite, Dolomite, &c., Serpentine and Steatite; Dolerite, Melaphyre, &c., Felstone, Felstone-porphyry and Elvanite; Diorite, Syenite; Hornblende Rock. Granites (intrusive and metamorphic). Glacial markings are numerous; ores are indicated. E. T. H.

Luxembourg. Carte géologique du Grand Duché de. By **N. Wies** and **P. M. Siegen.** 8 Sheets.

Newfoundland. Index Geological Map of. By **A. Murray.** Scale 25 miles to an inch. Ed. 2.

New South Wales. Geological Map of the Districts of Hartley, Bowenfells, Wallerawang, and Rydal. Scale 2 inches to a mile. By **C. S. Wilkinson, I. I. Baylis,** and **H. Wilkinson.** In Sheets, price 5*s.* each. [1877 ?]

Illustrates the extent and thickness of the mineral deposits.

Northumberland. Sheet 110 of the *Geological Survey Map.* Scale 6 inches to a mile. By **D. Burns.**

Shows Drift, Millstone Grit, and Yoredale Rocks.

——. Hydro-Geological Map of the Urban and Rural Sanitary Authorities. Districts of Alnwick and the Neighbourhood. By **F. R. Wilson.** Based upon the Ordnance Survey, aided by information supplied by **W. Topley.** Scale ¾ inch to a mile. *Alnwick.*

Shows the chief springs and rainfall. The border is ornamented with drawings of 33 springs and wells.

Northumberland and Durham. The Coal Seams of the Northumberland and Durham Coal Field, in the Upper or Regular Coal Measures. Being a series of Diagrams showing the Depth, Thickness, and Local Names of the Seams in several of the principal Collieries of the various Districts, with Index Geological Map and several Sections of Coal Measures; also North to South and East to West Horizontal Sections. By **J. B. Simpson.** *Newcastle-on-Tyne.*

43 Vertical Sections (12 in Northumberland, 31 in Durham), on a scale of 20 fathoms to an inch. The "General Section" extends from the Permian to the Millstone Grit, and shows 2120 feet of Coal Measures as known within the Coal-field. The most important seams are comprised between the "High Main" and the "Brockwell," 650 to 700 feet of strata. The Index map is on a scale of 6 miles to an inch. The Horizontal sections are on a scale of 3 miles to an inch horizontal, and 2000 feet to an inch vertical; one extends along the coast from the River Coquet to South Wengate; the other runs E. and W. from Medomsley, near the River Derwent, to Sunderland. W. T.

Saxony. Geologische Specialkarte des Königreichs Sachsen. Scale 1 : 25,000. 4 Sheets.

Blatt 60. Section Rochlitz. By **A. Rothpletz** and **E. Dathe.** Shows Rothliegende, Devonian, and Igneous.

Blatt 96 *a*, 96 *b*. Section Chemnitz. By **T. Siegert** and **J. Lehmann.** Carboniferous, Silurian, and Igneous.

Blatt 111. Section Zwickau. By **H. Mietzsch.** Oligocene, Zechstein, Rothliegende.

Blatt 112. Section Lichtenstein. By **H. Mietzsch.** Rothliegende.

[And a sheet of sections across the Zwickau Coal-field.] H. B. W.

Scania (Sweden). Geologisk öfversigts-karta öfver Skåne. By **N. P. Angelin.** Scale 1 : 275,000.

Though printed in 1859, this map was not published until 1877. 28 divisions shown. See notice of accompanying description, p. 49.

Scotland. Sheet 4 of the *Geological Survey Map.* Scale an inch to a mile. By **J. Horne** and **D. R. Irvine.**

The E. half of Wigtownshire and a part of the S.W. of Kirkcudbright. *Formations* :—Alluvium, Peat, Drift, Moraines, Raised Beaches, L. Silurian, Granite. A few Copper and Lead Veins, Glacial Markings, Diorite and Felstone dykes are shown. J. S. G. W.

——. Two sheets of "Horizontal Sections" of the *Geological Survey.* Scale 6 inches to a mile. Price 5*s*. each.

Sheet 7. By **Dr. James Geikie.** Section from Derrington Law, Berwickshire, across the U. Old Red Sandstone of Doyden Moss; Rumbledon Law and Hume Castle; The L. Carboniferous rocks in the valley of Tweed; the U. Old Red Sandstone of Lurden Law; L. Old Red Sandstone with associated Porphyrites (showing U. Old Red resting unconformably) of Caverton Mill, Shibden, Humblemoor, and Hindhope Hills; and ending in the U. Silurian of Hindhope and Brownhart Law.

Sheet 8. By **Dr. James Geikie** and **R. L. Jack.** Section from Dumgoyn, Strathblane, across the Calciferous Sandstone series to Craigend Muir; The Carboniferous Limestone series of Campsie Brae and Kelvin Valley; the Millstone Grit and Coal Measures of the Lanarkshire Coal-field; Calciferous Sandstone series lying in the valley of the Kittoch and Irvine water, and terminating in the Metamorphic rocks south of the Loudoun Hill. J. S. G.W.

——. Sheet 5 of the "Vertical Sections" of the *Geological Survey.* Scale 40 feet to an inch. By **B. N. Peach.** Price 3*s*. 6*d*.

Illustrating the Geology of the Stirlingshire and Clackmannanshire Coal-fields. No. 1. Section of Coal Measures at Grangemouth. No. 2. Section of the Stirlingshire Coal-field in the Neighbourhood of Falkirk, Redding, Bonnyhill, and Castlecary. This section extends from the Virtuewell coal to the Hirst in Arden. No. 3. Section of Coal Measures at Coney Park and Banknoch. No. 4. General Section of the Clackmannanshire Coal-field, extending from the Upper or red Coal Measures to the Coalsnaughton Main Coal. No. 5. Section of portion of the Carboniferous Limestone series at Netherwood near Castlecary. No. 6. Section of Millstone Grit series of Glenbervie, Larbert, commencing a little before the Slaty Band Ironstone, and extending to within a few feet of the Castlecary Limestone. No. 7. Section of Coal Measures at Lodge near Llamannan. No. 8. Section of portion of the Carboniferous Limestone series at Bannockburn and Plean, from bores on Berryhill and Muirmailing. No. 9. Section of portion of the Carboniferous Limestone at Kilsyth. No. 10. Section of portion of the Carboniferous Limestone series at Denny. J. S. G. W.

Sweden. *Sveriges Geologiska Undersökning.* [Swedish Geological Survey Map.] 5 Sheets on the scale of 1 : 50,000.

No. 57. **Stafsjö.** By **M. Stolpe, A. G. Nathorst, G. Gellerstedt, Y. Öberg,** and **G. A. Carlsson.** The formations are:—Postglacial (6 divisions), Glacial (4 divisions), "Eurite," Granular limestone, Garnet-gneiss, Grey and Red Gneiss, Grey and Red Granite-gneiss, Granite, Pegmatite, Diorite, and Diabase. Deposits of copper, cobalt, and iron-ores are shown.

Nos. 58 and 59 [together]. **Sandhamn and Färnskär.** By **A. G. Nathorst.** The formations are:—Postglacial (1 division), Glacial (3 divisions), "Eurite," Granular limestone, Garnet-gneiss, Red and Grey Gneiss, Hornblendic Gneiss, Diorite, and Pegmatite.

No. 60. Båstad. By **D. Hummel.** The formations are:—Postglacial (7 divisions), Glacial (5 divisions), Cambrian Sandstone, Red Gneiss, Diorite schist with garnet, Diabase. Deposits of coal are shown.

No. 61. Hessleholm. By **A. Lindström.** The formations are:—Postglacial (7 divisions), Glacial (2 divisions), Chalk, Red Gneiss, Hornblendic Gneiss, Diorite-schist with garnets, Diabase, and Granite. A deposit of kaolin is shown.

No. 62. Clæstorp. By **V. Karlsson, G. Gellerstedt,** and **E. Ekhoff.** The formations are:—Postglacial (6 divisions), Glacial (3 divisions), Quartzite and Mica-schist, Granular limestone, Grey and Red Gneiss, Grey and Red Granite-gneiss, Diabase, Pegmatite, Granite, and Diorite. Deposits of iron-ore are shown.

3 Sheets on the scale of 1 : 200,000.

No. 1. Huseby. By **D. Hummel, V. Karlsson, K. A. Fredholm,** and **C. Lalin.** The formations are:—Postglacial (5 divisions), Glacial (2 divisions), "Hälleflinta," Gneiss, Greenstone and Trap, Granite.

No. 2. Ljungby. By **D. Hummel, V. Karlsson,** and **C. A. Lalin.** The formations are:—Postglacial (5 divisions), Glacial (3 divisions), Gneiss, and Diorite-schist.

No. 3. Vexiö. By **D. Hummel, K. A. Fredholm, C. A. Lalin,** and **V. Öberg.** The formations are:—Postglacial (6 divisions), Glacial (2 divisions), "Hälleflinta," Gneiss, Diorite, Diabase, Diorite-schist, Porphyry, and Granite.

For descriptions to the sheets, see **Nathorst,** p. 84, **Hummel,** pp. 74, 75, **Lindström,** p. 79, **Karlsson,** p. 76. E. E.

Switzerland. Atlas géologique Suisse. Sheet 24. Scale 1 to 100,000. By the late — **Spreafico.**

Transvaal. [Map of the Transvaal Republic and surrounding Territories.] By **F. Jeppe.** Scale 1 : 1,850,000.
Indicates geological and agricultural characters.

Tyrone. Sheet 46 of the *Geological Survey Map* (Ireland). Scale 6 inches to a mile. [Noted in list of Geological Survey publications of 1876, but not published until 1877.]
Includes S.W. part of Dungannon Coal-field, and the villages Carland and Newmills. By **E. T. Hardman.** *Formations*:—Bog, Alluvium; Drift; Middle Gravels and L. Boulder Clay; Triassic, Bunter; Carboniferous. M. Coal Measures, with numerous Coals; L. Coal Measures; Gannister Beds, with workable Coal; Millstone Grit; Yoredale Beds; Upper, Middle, and L. Limestone, Basalt Dykes. E. T. H.

United States. Gray's Atlas of the United States and the World. Fol. *Philadelphia.*
Contains a geological map of the United States, with letterpress description, by **Prof. C. H. Hitchcock.**

Hydrogeological Survey. Sheet 1. Scale 1½ inch to a mile. By **Joseph Lucas.** Price £5 5*s*.
Includes S. London, Greenwich, Beckenham, Croydon, Ewell, Esher, Kingston, Richmond, Hounslow, Brentford, &c. Shows the Chalk Water System (with maximum and minimum Water Contours), the Thanet Sands Water System, the Artesian System (divided into:—1. Impervious Clays; 2. Areas of overflow, Original and Modern; 3. Artesian Contours, Chalk Springs, Original and Modern, Sand Springs, Original and Modern; and 4. Artesian Wells of various sorts). The various water contours are shown by coloured lines, and the contours of the top of the Chalk by white lines. W. W

SUPPLEMENT FOR 1874–1876.

Amsterdam Island. Carte géologique de l'ile d'Amsterdam au 1 : 60,000. By **Ch. Vélain.** [1876.]

Chattanooga. Map of the Chattanooga Mineral District (Unite States). Scale an inch to a mile. [1876.]
Shows the position of mines and minerals.

Corrèze. Atlas topographique agricole et géologique de la. [Various Contours.] By — **de Boucheporn.** (See GEOLOGICAL RECORD for 1876, p. 50.) Scale of geol. map 1 : 160,000. *Paris.* [1876.]

France. Carte géologique détaillée de la. 11 sheets (of the Map). [1874.]

Sheets 31. Rouen; 32. Beauvais; 33. Soissons; 47. Evreux; 48. Paris; 49. Meaux; 65. Melun; 66. Provins; 79. Châteaudun; 80. Fontainebleau; 81. Sens. By **Edmond Fuchs, A. Potier, A. de Lapparent, H. Douvillé,** and **F. Clérault.**

Show Tertiary, Cretaceous, and Neocomian strata, with subdivisions.

——. ——. *Coupes Longitudinales.* Scale 1 : 80,000. 2 Sheets. [1874.]

Pl. I. Coupe N.-S. Segment de la coupe générale menée suivant le méridien de Paris, passant Notre-Dame. By **H. Douvillé.**

Shows Tertiary and Cretaceous beds.

Pl. V. Coupe transversale du Pays de Bray suivant une ligne S.O.–N.E., passant au signal de Courcelles.

Coupe reliant le Vexin à la Picardie suivant une ligne S.O.–N.E. perpendiculaire à l'axe du pays de Bray. By **A. de Lapparent.**

Show Tertiary and Cretaceous beds. H. B. W.

——. ——. *Sections Verticales.* 4 Sheets. [1874.]

I., II. Paris. By **F. Clérault.**
IV. Meux. By **H. Douvillé.**
V. Beauvais. By **A. de Lapparent.**
} Tertiary and Cretaceous Beds. H. B. W.

——. ——. Légende géologique générale.—I. Lithologie. II. Stratigraphie. By **A. E. B. de Chancourtois.** [1874.]

——. ——. Légende technique. Matières minérales ou fossiles d'une utilité spéciale. [1874.]

——. ——. 5 Sheets (of the Map). [1875.]

Sheet 7. Arras, by **A. Potier,** shows Tertiary, Cretaceous, and Trias. Sheets 20. Neufchatel, 21. Montdidier, 64. Chartres, by **Edmond Fuchs, A. Potier, A. de Lapparent, H. Douvillé,** and **F. Clérault,** show Tertiary and Cretaceous beds. Sheet 22. Laon, by **A. de Lapparent,** shows Tertiary and Cretaceous beds.

——. ——. *Coupes Longitudinales.* Scale 1 : 80,000. 2 Sheets. [1875.]

Pl. III. Coupe O.-E. Segment de la coupe générale menée suivant le Parallèle de Paris.—Plateau de la Brie. By **H. Douvillé.** Shows Tertiary and Cretaceous beds.

Pl. XII. Pays de Bray. Coupes dirigées du S.O. au N.E. perpendiculairement à l'axe du soulèvement. By **A. de Lapparent.** Shows Tertiary and Cretaceous beds.

France. Carte géologique détaillée de la. 7 Sheets (of the Map). [1876.]

Sheets 2. Dunkerque, by **A. Potier**; 3. Boulogne, by **H. Douvillé**; 4. St.-Omer, 5. Lille, 6. Montreuil, by **A. Potier**; 13. Cambrai, by **M. Jacquot**; 12. Amiens, by **Edmond Fuchs** and **F. Clérault.** Show Tertiary, Cretaceous, Oolitic, and Carboniferous beds.

——. ——. *Coupes Longitudinales.* Scale 1 : 80,000.

Pl. II. Coupe O.-E. Segment de la coupe générale menée suivant le Parallèle de Paris. By **H. Douvillé.** Shows Tertiary and Cretaceous.

VII. Coupe S.O.-N.E. menée transversalement à la Vallée de la Seine et au Pays de Bray. By **A. de Lapparent.** Shows Tertiary and Cretaceous. H. B. W.

Hungary. Geologische Specialkarte der Königreich Ungarn. By **M. von Hantken, K. Hofmann, J. Böckh,** and others. Sheets 1–5. *Budapest.* [1874–1876.]

Liége. Carte géologique du Bassin Houiller de. By **Julien de Macar.** *Liége.* [1876.]

Prussia. Geologische Karte der Provinz Preussen.—Littanen, Nordsudanen. Scale 1 : 100,000 (2 sheets). [1876.]

Rethel. Carte géologique agronomique de l'arrondissement de Rethel (Ardennes). [Geological and Agricultural Map of the Arrondissement of Rethel.] By **Meugy** and **Nivoit.** *Paris.* [1876 ?]

Seine. Carte géologique de l'Embouchure de la. By — **Lennier,** [1875 ?]

[**United States.**] Engineer Department, U. S. A. Geological and Topographical Atlas accompanying the Report of the Geological Exploration of the Fortieth Parallel........ By **Clarence King.** Large folio. [1876.]

Geological Series. Maps, each in 2 sheets, scale 4 miles to an inch, sections at

I. *Rocky Mountains.* Quaternary, Tertiary, Cretaceous, Jurassic, Triassic, Palæozoic, Archæan, and Eruptive Rocks: 18 divisions in all.

II. *Green River Basin.* Quaternary, Tertiary (5 divisions), Cretaceous (4 divisions), Jurassic, Triassic, Carboniferous (3 divisions), Archæan, and Eruptive Rocks: 18 divisions in all.

III. *Utah Basin.* Quaternary, Tertiary, Cretaceous, Jurassic, Triassic, Carboniferous, Devonian, Silurian, Cambrian, Archæan, and Eruptive Rocks: 29 divisions.

IV. *Nevada Plateau.* Quaternary, Tertiary, Carboniferous, Devonian, Silurian, Cambrian, Archæan, and Eruptive Rocks: 25 divisions.

V. *Nevada Basin.* Quaternary, Tertiary, Jurassic, Triassic, Carboniferous, Archæan, and Eruptive Rocks: 23 divisions.

General Sections. Scale 4 miles to an inch, in 2 sheets, 37 divisions of Sedimentary and Eruptive Rocks. W. W.

United States. Geological Map of the. By **Profs. C. H. Hitchcock** and **W. P. Blake.** *New York.* [1874.]

United States east of the Rocky Mountains, and of Canada. Geological Chart of. By **F. H. Bradley.** [1875.]

Comprises Archæan, L. and U. Silurian, Devonian, Carboniferous, Permian, Trias, Jurassic, Cretaceous, and Tertiary.

MISCELLANEOUS AND GENERAL.

Sub-Editor E. B. TAWNEY, M.A., F.G.S.

Alcock, Sir Rutherford. Address at the Anniversary Meeting of the Royal Geographical Society. *Proc. R. Geogr. Soc.* vol. xxi. p. 407.
Refers to the "Challenger" and "Arctic" Expeditions, the geology of parts of Asiatic Russia (p. 449), and Richthofen's "China" (p. 477).

[**Anon.**] **Ignoramus.** Christmas Nuts to Crack for Geologists, Astronomers, and others. Pp. 24. 8vo. *Oxford* and *London.*

[**Anon.**] **Verifier.** Scepticism in Geology, and the reasons for it. An Assemblage of Facts from Nature opposed to the Theory of "Causes now in Action," and refuting it. 8vo. *London.* Price 6*s.*

Anon. Fossil Man. *Chambers' Journal*, no. 692, pp. 200–202.
Notes of human remains reputed to be "fossil."

——. A Buried City. *Chambers' Journal*, no. 727, pp. 766–768.
Description of Herculaneum and its volcanic covering.

Belt, T. Man and the Glacial Period. *Pop. Sci. Monthly*, November.

Boaden, William. Historic Geology. *Trans. Barrow Nat. Club*, vol. i. pp. 43-47.
Gives arguments, from the thickness of rocks, rate of denudation, terrestrial physics, &c., bearing on the age of the earth.

Brown, Dr. R. The Countries of the World. 8vo. *London.* Vol. i. parts 5–10, pp. 129–320, and vol. ii. parts 11–16, pp. 1–192.
Describes the Arctic regions, Canada, and part of the United States. Physical and geological notes scattered throughout.

Callaway, Charles. The Migration of Species as related to the Correlation of Geological Formations. *Geol. Mag.* dec. ii. vol. iv. pp. 445–447.
Observations on migration as bearing on the contemporaneity of distant strata. In Palæozoic times there was greater equability of

climate and more rapid migration; consequently identity of species is a better proof of contemporaneity of deposit than in younger formations.
W. H. D.

Case, Col. T. S. Evolution. Some of the Objections to the Evolution Theory. *West. Rev. Sci. Ind.* vol. i. pp. 577–593.
Reviews the evidence from palæontology as against evolution.

Clark, D. K. A Manual of Rules, Tables, and Data for Mechanical Engineers. . . . . . Pp. xxvii, 984; 353 woodcuts. 8vo. *London.*
Volumn, weight, and specific gravity of metals, stones, ores, &c., pp. 200–216; fuels, composition, &c., pp. 409–457; strength of stones, pp. 629–632. W. T.

Clark, J. E. Fossil Hunting. *Nat. Hist. Journ.* vol. i. pp. 33–35.
Hints on collecting.

Cossham, Handel. Coal and its Uses. Pp. 32. 8vo. *Bath.* Reprinted from Keene's *Bath Journal*, and *Coal and Iron Trades Gazette*, no. 167, pp. 1273, 1274, and no. 168, pp. 1303, 1304.
Notices the composition of coal, the flora, the extension in polar regions, the theory of its formation, and the movements and denudation which have separated the various basins. Discusses the consumption and duration of our coal resources. E. B. T.

Cotta, Prof. B. von. Geologisches Repertorium mit einem vollständigen Index. Pp. viii, 400. 8vo. *Leipsic.*
A list of geological writings from 1530 to 1876, arranged chronologically. Includes special papers on chemical, mineralogical, or palæontological subjects. Gives a treble index of authors, places, and subjects. References are usually given to notices in *Neues Jahrbuch*, not to the original authors. E. B. T.

Croll, J. On the probable Origin and Age of the Sun. *Quart. Journ. Sci.* n. ser. vol. vii. pp. 307–326.
The heat produced in the sun by gravitation in condensing the nebulous matter could not have supplied the earth (at its present rate) for more than 20 millions of years. Yet the evidence of old denudations proves the existence of life on the earth for more than twice that time. The conclusion is that there must also have been some other source of heat. The nebulous matter may have previously been in a highly heated state. The heat which it thus possessed as a nebulous incandescent mass may have been derived from motion in space. Two bodies, each one half the mass of the sun, moving towards each other with a velocity of 476 miles a second, could by their concussion generate 50 million years' heat. Such a collision might dissipate the bodies into vapour, which would afterwards give up its heat on condensing. In a note on Sir W. Thomson's arguments for the age of the earth, the argument from tidal retardation is met by the consideration that as the sea-level at the equator was lowered from loss of rotation, the land would be more wasted by sub-aerial denudation. F. D.

Dall, W. H. Tribes of the Extreme Northwest, being Part 1 of Contributions to North American Ethnology. Vol. I. *U. S. Geogr. and Geol. Survey Rocky Mountain Region.* 4to. *Washington.*

II. Succession in the shell-heaps of the Aleutian Islands, pp. 41–91. A gradual progression in the people, from a lower stage, is shown.

Daubrée, —. Expériences sur la schistosité des roches et sur les déformations de fossiles corrélatives de ce phénomène; conséquences géologiques qu'on peut en déduire. [Experiments on Cleavage and consequent Distortion of Fossils: Geological Deductions.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 529–553, pl. xix.

Cleavage, crushing, &c. artificially produced (see p. 213).

Davis, J. W. Summary of Geographical Literature relating to the West Riding published during 1876. *Proc. Geol. Soc. W. Riding Yorksh.* n. s. pt. iv. pp. 318, 319.

Dawkins, Prof. W. B. On the Antiquity of Man. *Trans. Manch. Geol. Soc.* vol. xiv. p. 290–300.

Creswell Caves prove man the contemporary of the mammoth, woolly rhinoceros, cave hyæna, reindeer, &c., of artistic culture similar to that of the hunters of the reindeer in Auvergne, and like them surrounded by a mixed fauna of northern and southern types. No evidence of Interglacial man has been found in Britain or Switzerland, though he probably lived before, during, and after the Glacial epoch in those countries. C. E. R.

Dawson, Dr. J. W. The Origin of the World according to Revelation and Science.

Covers the same ground with 'Archaia' (1860), but has been revised and in great part rewritten. Intended as an exposition of what is known of the meaning of the history of creation in Genesis, and of its relations to the discoveries of modern science. E. B. T.

——. Fossil Agricultural Implements. A Note on American Flint Hoes. *Journ. Vict. Inst.* vol. xi. pp. 29–32.

Draws attention to the occurrence of "roughly shaped hoes" in the large alluvial deposits near the rivers of America, proving an agricultural population among the ancient Americans. R. B. N.

Delesse —, and — De Lapparent. Revue de Géologie. Tome xiii. pp. 252, and coloured map. 8vo. *Paris.*

Notice of geological progress and publications in 1874–1875. The following classification is observed:—1. General works. 2. Lithological. 3. Historical (stratigraphical, &c.). 4. Geographical; maps and detailed memoirs on special districts. 5. Dynamical. Table of contents and index of authors. The map is an agricultural one, of France; scale 1 : 4,000,000. E. B. T.

Delfortrie, E. Altération résultant du pseudomorphisme dans la structure de certains ossements fossiles provenant des couches marno-sableuses du falun. [Metamorphism of Bones.] *Act. Soc. Linn. Bordeaux,* ser. 4, t. i. pp. 201–203.

Bones of Cetacea and Sirenia, from the marine marly strata of Martignas and Narosse, retain their original form though the osseous structure has disappeared. W. G.

Duvillier, E. Sur la présence de l'acide phosphorique dans toute la série géologique. [Phosphoric Acid present in all Geological Ages.] 8vo. *Lille.*

Frazer, Prof. P., Junr. Note on the "Lithologie du Fond des Mers" of M. Delesse. *Proc. Amer. Phil. Soc.* vol. xvi. pp. 238–240.

Shows the scope and direction of this work of M. Delesse. Some remarks are also made by **Mr. Lesley.**

Geikie, Prof. A. Elementary Lessons in Physical Geography. Pp. x, 1–375; 78 cuts and 10 plates.

Chap. iii. Sea, refers to marine denudation; chap. iv. Land, refers to volcanos, springs, denudation, &c.

——. Mountain Architecture. A Lecture. *Glasgow Science Lectures.* Pp. 39; 8 cuts. 8vo. *London* and *Glasgow.* Price 4*d.*

Describes:—(1) The materials of the mountains (crystalline and fragmental rocks); (2) The building of the mountains (formation of the strata, wrinkling of them from contraction); (3) The sculpture of the mountains by ice wedges, snow and glaciers, rain, and rivers. F. D.

Gindorff, F., A. Habets, and A. Rutot. Rapport sur la question de la carte géologique détaillée de la Belgique. [Report on the proposed Geological Map of Belgium.] *Ann. Soc. Géol. Belg.* t. iv. Bull. pp. lvi.–lix.

Report on three schemes for carrying out the requisite surveys, &c. 1. Capt. Hennequin's; 2. Prof. Dewalque's; 3. That of the Liége Section of the Engineers' Association. In favour of Prof. Dewalque's. G. A. L.

Giordano, F. Cenni sul Lavoro della Carta geologica. *Ann. Minist. Agric. Ind. Comm.* vol. 86, pp. 22.

A history of the undertaking for the geological map of Italy; its origin in 1861; speedy stoppage; its second start in 1867, with appointment of the geological commission, the foundation of collections, &c. The publications began in 1870, and were the work of private geologists, aided by small subsidies. Since 1873 the nucleus of a permanent staff has been in training, and the map begun in the Caltanissetta district, the sulphur district of Sicily; scale 1: 50,000. E. B. T.

Grant, Rev. W. The Bible Record of Creation True for every Age. 8vo. *London.*

Gwatkin, Rev. R. Mosaic Geology. *Trans. Leicester Lit. Phil. Soc.* pt. iii. pp. 79, 80. [Read 1842.]

The Mosaic 6 days descriptive of geological periods.

Hall, H. F. The Work of Creation as Illustrated by Geological Research. *Trans. Barrow Nat. Club*, vol. i. pp. 89–97.

Argues Divine design, from the suitability of the earth for habitation, as the result of geological actions (of which many details are given), and from the unity of plan in organic life. W. H. D.

Hébert, Prof. E. Notice sur les Travaux Scientifiques de M. E. Hébert, Professeur de Géologie à la Faculté des Sciences de Paris. Pp. 52. 4to. *Paris.*

Chronological list of his papers, 1845–1876. Classification of them by formations. Summary, with 4 woodcut maps of the principal discoveries therein noticed. W. H. D.

Hector, Dr. J. Index to the Transactions and Proceedings of the N. Zealand Institute, vols. i. to viii. Pp. 44. *Wellington* and *London.* 8vo.

Appendix, "Index to Scientific Papers and Reports contained in the Parliamentary Papers of the General Assembly of New Zealand." Many geological papers catalogued. R. E., Jun.

Helmhacker, R. Ueber das Vorkommen des Steinsalzes. [Geology of Rock-salt.] *Berg- hütt. Jahrb.* Bd. xxv. pp. 283–324.

Reviews the geological position and phenomena of the principal salt-deposits of the world. The origin of thick masses of salt, like those of Stassfurt and Cardona, is attributed not to the concentration of salt water in an enclosed basin, but in deep bays partially barred from the open sea by lateral barriers, so as to allow free ingress for the sea-water, but no outlet except by evaporation, the salt in solution being deposited in the order of the solubility in the bottom of the bay. H. B.

Hemsley, W. B. The Geographical Distribution of Plants. *The Garden*, vol. xii. no. 313, pp. 476–479.

Refers to the evidence of fossil plants, to geological changes, to the agents now active in modifying nature, and to those which have effected the present distribution of plants. Notices the effects of climate on vegetation. H. B. W.

Henrich, F. Vorträge über Geologie. Heft 1. Pp. 98. 8vo. *Wiesbaden.*

Heywood, James. The Antiquity of Life. *Sunday Review*, vol. i. no. iii.

Howard, D. On the Structure of Geological Formations, as Evidence of Design. *Journ. Vict. Inst.* vol. xi. pp. 382–393; discussion pp. 393–400.

Argues that the forces of nature, as exemplified through past ages, strengthen rather than diminish the belief in a Creator.

Huxley, Prof. T. H. Physiography: an Introduction to the Study of Nature. 8vo. *London.* Pp. ix, 384; 5 coloured plates and 122 woodcuts. Price 7*s.* 6*d.*

Chap. xvii. is devoted to the geological structure of the Thames Basin. The general principles of geology popularly explained throughout.

——. American Addresses, with a Lecture on the Study of Biology. Pp. 164. 8vo. *London.*

Three lectures on evolution, which contain many palæontological notes and references to the structure of various vertebrate fossils.

Jacquinot, Dr. H. Considérations sur les différents âges de la pierre. Réponse aux objections faites au Congrès de Budapest. [Remarks on the Different Stone Ages.] *Bull. Soc. Niv. Lett. Sci. Arts*, pp. 14.

Jones, Prof. T. Rupert. Lecture on the Antiquity of Man, illustrated by the Contents of Caves and Relics of the Cave-folk. [See GEOLOGICAL RECORD for 1876, p. 324.] Revised and augmented. *Croydon Microscop. Club.* Pp. 52, folding plate (map and sections).

Notices subsidences and emergence in the Glacial epoch, interglacial period, &c.; evidences of prehistoric man from Danish peat-bogs and forests, Swiss lake-dwellings and caves, &c.; older river-gravels of England, their fauna and that of the older coal-deposits where palæolithic man has also left remains. Concludes that Neolithic man dates from more than 6700 years ago, whilst Palæolithic man may have existed in Britain 150,000 years ago. Tables of classification of European Post-Tertiaries, of Quaternary British deposits, and detailed account of Kent's Cavern deposits are added. W. H. D.

King, Capt. C. C. Flint Implements. *Pop. Sci. Rev.* n. s. vol. i. pp. 342–352, plate ix.

Describes the probable mode of manufacture. Chiefly refers to flakes and neolithic implements.

King, Clarence. Catastrophism and Evolution. *Amer. Nat.* vol. xi. pp. 449-470.

A disquisition on the theories of Evolution and Uniformitarianism on the one hand, and that of Catastrophism on the other; with special reference to the bearing of the most recently investigated facts of American geology. Concludes that upon the whole the theories of Uniformitarianism have been carried too far, and that the geological phenomena of N. America prove that the order of events there has been catastrophic. H. A. N

Kingsmill, T. W. The Border-lands of Geology and History. *Journ. N. China Branch R. As. Soc.* Pp. 31. (An Inaugural Address.)

Kirby, W. F. Notes on the Geographical Distribution of Animals. *Pop. Sci. Rev.* n. s. vol. i. pp. 261–269.

Notes the effects of the Glacial period, and refers to the extinction or expulsion of animals through changes of physical geography brought about by human agency. W. T.

Lapparent, A. de. La Doctrine des Causes Actuelles et l'étude Microscopique des Roches. [The Doctrine of Existing Causes and the Microscopic Examination of Rocks.] *Ann. Soc. Sci. Bruxel.* an. i.

——. Conseils à un jeune amateur de géologie. [Advice to a Young Geologist.] *Bulletin de la Société nationale Havraise d'études diverses*, années 41, 42, p. 333; and *L'Année Médicale, Journ. de la Société de Médecine de Caen et du Calvados*, an. 2, pp. 145–158.

A humerous sketch, in verse, of some of the principal points in geology.

Lebour, G. A. On the Terms "Bernician" and "Tuedian." *Geol. Mag.* dec. 2, vol. iv. pp. 19–23.

For "Bernician" (Woodward, 1856) there are eight lithological synonyms and but one geographical (Condrusian), which includes Devonian as well as L. Carboniferous. For "Tuedian" (Tate, 1855) there is only the lithological name Calciferous Sandstone Series, dangerously like other names. W. H. D.

——. A Geological Curiosity. *Athenæum*, no. 2580, April 7, p. 451.

Notices the work of J. B. A. Beringer, entitled "Lithographiæ Wirceburgensis," &c., 1726.

Le Conte, [Prof.] J. On Critical Periods in the History of the Earth, and their Relation to Evolution; and on the Quaternary as such a Period. *Amer. Journ.* ser. 3, vol. xiv. pp. 99–114, and *West. Rev. Sci. Ind.* vol. i. pp. 478–483, 522–530.

Unconformities mark oscillations, geographical and climatal changes, affecting organic life, which therefore changes most when no record is being preserved. The Quaternary is a period of widespread oscillation and variation of climate, &c., and of rapid change in at least the mammalian fauna. W. H. D.

Lista, Ramon. Sur les débris humains fossiles signalés dans la République Argentine. [Fossil Human Remains found in the Argentine Republic.] *Journ. Zool.* t. vi. pp. 153–157. Extract from the *Buenos Ayres Tribune.*

The various accounts of the coexistence of Man with the large extinct quadrupeds of the Pampas are noticed, and the conclusion arrived at that the coexistence is very problematical, and that the objects of Indian industry found belong to the epoch of the modern alluvium before the Conquest. E. T. N.

Mackay, Dr. Al. Physiography and Physical Geography. 12mo. Price 1*s*. 6*d*.

Melvin, James. On the Nature and Origin of the Surface or Vegetable Soil, and its Influence on Geological Phenomena. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 124–134.

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Refers to theories of the Glacial period, and to the Arctic Expedition.

Mudge, Prof. F. B. Flesh Fossilization an Impossibility. *West. Rev. Sci. Ind.* vol. i. pp. 484, 485, 625, 626.

Petrifaction takes place too slowly to preserve any but the firmest cartilage, bones, or shells of animals.

Nehring, Dr. A. [On a Prehistoric Steppe in Saxony.] *Naturforscher.* Noticed in *Nature*, vol. xv. p. 542.

Nicholson, Prof. H. A. Ancient Life-History of the Earth: a comprehensive Outline of the Principles and Leading Facts of Palæontological Science. Pp. 407; 270 engravings. 8vo. *Edinburgh* and *London.*

Treats of Palæontology from its historical side, and in its relations to historical Geology. The introductory part deals with the general principles of Palæontology, and their bearing upon various geological problems, such as the mode of formation of the sedimentary rocks, the reactions of living beings upon the crust of the earth, and the sequence in time of the fossiliferous formations. The second part gives a summary of the main outlines of historical Palæontology, each formation being considered separately as regards its lithological nature and subdivisions, its relations to other formations, its geographical distribution, its mode of origin, and its characteristic fossils. The last chapter treats of the succession of life upon the globe. H. A. N.

——. On the Palæontological Significance of the Migrations of Animals. *Trans. Edin. Geol. Soc.* vol. iii. pt. i. pp. 1–10.

Where species are absent from a formation between rocks in which they occur, they are often found in a different area in rocks of the intermediate age, showing migration and return. Barrande's "colonies" are somewhat similar cases. The identity of species in districts far apart also proves migration. The modes of migration of sessile Invertebrates and plants are noticed. W. H. D.

Nicols, A. The Puzzle of Life, and how it has been put together. A short history of the formation of the Earth, with its vegetable and animal life from the earliest times, including an account of

Prehistoric Man, his weapons, tools, and works. Pp. 173, and 13 full-page cuts. Ed. 2. 8vo. *London.*

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Price, Eli K. The Glacial Epochs. *Proc. Amer. Phil. Soc.* vol. xvi. pp. 241–276.
Discusses the different views held on this subject.

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The chemical composition, principal deposits, and mode of formation of limestone.

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The decreasing energy of the sun and of the earth must have led to diminishing rapidity in the action of three of the main factors of geologic change—denudation, reproduction, and elevation and depression.
R. B. N.

Southall, Dr. James. The Epoch of the Mammoth, and the apparition of Man upon Earth. Pp. xvi, 430. 8vo. *London.* Price 10*s.* 6*d.*

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The many maps, models, collections of fossils, &c. exhibited are all mentioned; only those described in some detail are noted here.—Section 15. *Geography.* Notices of 4 Maps by **A. Delesse,** pp. 811, 812; Agricultural and Hydrological [Hydrogeological] Maps of France; Submarine Chart of European Seas; Ancient and Present Seas of France.—Section 16. *Geology and Mining.* Maps, &c. of the GEOLOGICAL SURVEY, pp. 816–821, 827, grouped as follows:—Indexes; Cornwall and W. Devon; E. Devon, Somerset, Dorset, and Wilts; Wealden Area; N. Wales; Mid Wales; Midland Counties (in 2 Maps), Lancashire Coal-field; Yorkshire Coal-field; Index Map of Wales; Ireland, Scotland, Ayrshire Coal-field; Drawings of Microscopic Structure of English Igneous Rocks, **F. Rutley** and **J. C. Ward**, pp. 821–823, 824–827; Sub-Wealden Boring, **H. Willett** and **W. Topley**, pp. 837–839; Microscopical Preparations of Spanish Rocks, **F. Quiroga**, pp. 840–843; Geological Section from Paris to Brest, **A. Delesse**. Various specimens and Models, **H. C. Sorby**, pp. 845, 846. Collection of Fossil ,stnalP **Baron von Ettingshausen**, pp. 852–860; Table of British Strata, **H. W. Bristow**, p. 861. Collections of Fossils and Rocks from Russia, pp. 861–866, 868, 869.—Section 17. *Mineralogy*. Russian Minerals, pp. 889–893. W. T.

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Urges M. Lapparent's views (see p. 365).

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Note on Carboniferous rocks.

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Etheridge, R. Palæozoic Rocks under London. [Tottenham Court Road.] *The Times*, May.

Upper Devonian (Eifelian) shales were reached at 1073 feet, under London Clay [Lower Tertiaries], Chalk, U. Greensand, Gault, and L. Greensand. The Devonian has a dip of 30°. W. H. D.

Feilden, Capt. H. W. The Post-Tertiary Beds of Grinnell Land and North Greenland. *Annals*, ser. 4, vol. xx. pp. 483–489. (See **Jeffreys**, p. 313.)

Adduces evidence of recent elevation, describing beds of marine mud, &c. at various levels up to more than 1000 feet.

Feistmantel, Dr. Ottakar. The Gondwána Series of India. *Geol. Mag.* dec. ii. vol. iv. pp. 188, 189.

Corrections to paper in vol. iii. p. 481.

——. Cycadaceæ in the "Damuda Series" and the Nursrhan Gas-coal of Bohemia. *Ibid.* pp. 431, 432.

On criticisms of his paper in same vol. See above, p. 63.

——. [The Rhætic Formation of the Argentine Republic.] *N. Jahrb.* pp. 178–181.

Critical remarks on Geinitz's paper, noticed in the GEOLOGICAL RECORD for 1876, p. 304.

Frazer, Prof. P., Jun. On the Hudson River and Utica Slates of Pennsylvania. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vii. pp. 14–16.

The blackness of these slates has induced much fruitless search for coal. An analysis is given.

——. Anthracite from "Third-Hill Mountain," West Virginia. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vii. pp. 16, 17.

Gives analysis.

——. On Copper-bearing Rocks of the Mesozoic Formation. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vii. pp. 17–19.

Describes a bed-vein near Gettysburg, giving analysis of ore.

Gaudry, Prof. Albert. Les animaux quaternaires de la montagne

de Santenay. [Quaternary Fauna of Santenay.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 682–685.
List of mammals from cave- and fissure-breccia, probably of Glacial date.

Goldsmith, E. On Lavendulite from Chili, S. A. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vii. pp. 192, 193.
Gives analysis.

Groth, Prof. P. Das Gneiss-Gebiet von Markirch im Ober-Elsass. *Abh. geol. Specialkarte Elsass-Lothringen*, Bd. i. Heft 3, pp. 395–489, tab. 1 (map and section).
The gneiss district of Markirch has two divisions of different age, viz. the lower gneiss, which rests on Bressoir granite, and the younger or garnet-gneiss. As bands in this second gneiss, are found hornblende-gneiss, serpentine, and limestone: it is succeeded by the Leberan greywacke, of which the exact age is not determined. The Vosges sandstone overlies all. The above rocks are described from field and microscope examination. The Bressoir is a muscovite-granite. The older gneiss contains Cordierite-gneiss, also graphite as a constituent frequently: the younger is more variable, sometimes laminated from abundance of biotite, or granular, and passes to leptynite; it contains also lenticular masses of hornblende-gneiss and granular limestone in three horizons. A serpentinous constituent, formerly cited as pyrosclerite, is shown to have much the composition of chlorite, and is here called *Pseudophite*. Among dykes occur fine-grained granite, granite-porphyry, with cordierite pseudomorphs and Kersanton. E. B. T.

Guise, Sir W. V. Annual Address, 1877. *Proc. Cotteswold Club*, vol. vi. pp. 279–296.
Contains remarks on papers read during the season; note on *Terebratula punctata* (pp. 283, 284); geological notes on Field Meetings, Malmesbury (p. 289), Purton, with observations by **Mr. Sadler** on Purton Spa, and list of fossils from the *Perarmatus* zone of the Coralline Oolite of Purton, by **Dr. F. Smithe** (pp. 290–293), Dundry Hill, with notes by **W. W. Stoddart**, and a note on "Whorley Pitts" by **G. F. Playne** (pp. 293–296). H. B. W.

Jannettaz, —. Sur la conductibilité thermique de certaines roches rendues artificiellement schisteuses. [Thermal Conductivity of Artificially-cleaved Rocks.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 553, 554.
The conductivities are like those of natural cleaved rocks.

——. Note sur la propagation de la Chaleur dans les corps cristallisés. [Conductivity of Crystals.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 554, 555.
From experiments with Cordierite, Diallage, &c., shows that heat travels fastest along the cleavage-planes.

Koenig, Dr. G. A. On Enstatite. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vii. pp. 198, 199.

Occurs with Corundum in Georgia. Is monoclinic. Analysis gives the formula, $Fe\ Mg_{12}Si_{14}O_{21}$.

——. Protovermiculite, a New Mineral Species. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vii. pp. 269–272.

New name for Hydrophilite (preoccupied). Further description and analyses. It is near Culsageeite, but has 2 instead of 6 molecules of water. W. H. D.

——. Mineralogical Notes. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vii. p. 276.

Analysis of a mixed silver ore from Lake Superior, Ag. 32 p. c.

——. On Strengite from Rockbridge Co., Va. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vii. pp. 277, 278.

Describes *Strengite* crystallographically and chemically. Analysis shows it to be identical with Nies's new species (see p. 245).

Lapparent, A. [Clay-with-flints, Châlons.] *Bull. Soc. Géol. France,* sér. 3, t. iv. pp. 671, 672.

Refers this deposit to the solution of the Chalk by geyserian water.

Lory, Ch. Sur les causes probables de l'accumulation des ossements dans la brèche de Santenay. [Origin of the Bone-breccia of Santenay.] *Bull. Soc. Géol. France,* sér. 3, t. iv. pp. pp. 686–689.

Owing to inundations in the Glacial period, the animals crowded on the hills, in the caverns and crevices of which their bones are found.

Martin, Jules. Sur les Argiles à silex de la côte Châlonnaise. [Clay-with-flints, Châlons.] *Bull. Soc. Géol. France,* sér. 3, t. iv. pp. 653–656.

Refers this deposit to the action of Eocene glaciers.

Mercey, N. de. Note sur la direction adoptée pour le tracé des coupes de la Carte géologique du département de la Somme, et sur certains rapports entre la structure du sol de la Picardie et celle du détroit du Pas de Calais. [Mode of Construction of the Sections of the Somme, and Relation of the Structure of Picardy with that of Dover Straits.] *Bull. Soc. Géol. France,* sér. 3, vol. iv. pp. 559–567.

The undulations of the rocks in Picardy are parallel to the straits, which may contain an undulation, and this would affect the tunnel. W. H. D.

Michel-Lévy, A. Réponse à la note de M. Delafond sur les terrains porphyrique, houiller et permien de l'Autunois, et Observations sur la Roche verte des environs de Cussy-en-Morvan. [On M. Delafond's paper (see p. 362) and on the Green Rock of Cussy-en-Morvan.] *Bull. Soc. Géol. France,* sér. 3, t. iv. pp. 729–736.

Thinks (contrary to Delafond's views) that the upper part of the anthraciferous porphyry series is L. Permian.

Michel-Lévy, A. Note sur les Roches éruptives vues par la Société dans sa course du 30 août 1876. [Eruptive Rocks near Autun.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 749–755.
Notes on granitoid, porphyroid, metamorphic, and metalliferous rocks.

Morris, G. C. On Mineral Caoutchouc. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vii. pp. 131, 132.
From Coorong, S. Australia. The country consists of sand, over limestone, over sandstone and quicksand (information from **C. W. Stuart**). *Coorongite*, an associated mineral, consists of diatoms united by hydrocarbon. Gives analyses of the caoutchouc. W. H. D.

Nikitin, S. Die Sperlingsberge (Worobiewi-Gori) als jurassische Gegend. [Jurassic of Mt. Sperling, Worobiew Mts.] *Bull. Soc. Imp. Nat. Mosc.* t. lii. pt. 1, pp. 97–116, pl. iii.
Describes the beds in 6 divisions, giving lists of fossils, with remarks on some of the species. Describes and figures as new *Rhynchonella worobiewensis* and *Cyprina rectopalliata*, with others. W. H. D.

Pellat, Edm. Sur le terrain jurassique des environs de Châlon-sur-Saône. [Jurassic of Châlons.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 648–651. See **Delafond**, p. 362.

——. Lias inférieur de Borgy, Oolithe inférieure et Grande Oolithe de Santenay. [L. Lias and L. Jurassic of Santenay.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 700–705.

——. Zone à Avicula contorta, Infra-lias et Lias inférieur (étages rhétien, hettangien et sinémurien) de Mazenay; Lias moyen et Lias supérieur (étages liasien et toarcien) de Rome-Château (Saône-et-Loire); Lias et Calcaire à entroques de Nolay (Côte-d'Or). [Rhætic and Lias of Mazenay, &c.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 705–718, pl. xxi. fig. 1.
Stratigraphical details.

——. Compte-rendu de l'excursion du 30 août 1876 à Auxy, La Coudre, Antully et Drevin. [Excursion near Autun.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 738–749, pl. xxi. fig. 2.
Notes on Trias, Rhætic, and Lias.

Rand, T. D. On the Rocks near Philadelphia. *Proc. Ac. Nat. Sci. Philadel.* ser. 3, vol. vii. pp. 251–254.
Notes trend, sequence, &c. of metamorphic and igneous rocks.

Rosemont, Ch. de. La brèche quaternaire de Santenay. [Quaternary Breccia of Santenay.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 692–695.

Refers the ossiferous breccia to a pluvial period, in which a metre of rainfall was a daily average. The red loam of the Jurassic plateaux (previously formed by atmospheric action on the limestone) was washed, with mammalian carcasses, into the crevices and caves. W. H. D.

Sandberger, F. Ueber Braunkohle und die Pflanzenwelt der Tertiärzeit. [Brown Coal and Tertiary Plants.] *Vortrag Vereine wissensch. Vorlesungen zu Dortmund*, 5 March.

Sebille, —. [Recent Oscillation near Crousot.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 736–738.

Evidences of recent differential elevation.

Smithe, Dr. F. On the Middle Lias of North Gloucestershire. The *Spinatus* Zone. *Proc. Cotteswold Club*, vol. vi. pp. 349–405.

Gives the synonyms of this zone (which is the uppermost part of the M. Lias), and a table of the correlation of the U. and M. Lias in England, Germany, and France. Describes the petrological characters of the zone at Churchdown Hill, and gives an account of its general and special palæontological features, with lists (1) of the Classical, or leading Fossils, (2) of the most abundant Fossils, (3) complete list of Species. Concludes that the zone was a sublittoral marine deposit in a warm climate. Notes and sections of the same beds elsewhere in Britain, France, and Germany are given. H. B. W.

Symonds, Rev. W. S. Among the Volcanoes and Glaciers of Auvergne. *Pop. Sci. Rev.* n. ser. vol. i. pp. 1–22, map.

A general description of the district. Believes, with M. Lecoq, that the Domite of the Puy de Dôme is of the same age as that of Mt. Dore. Reviews and accepts the evidence for glacial action in the district; there may have been volcanic outbursts since. W. T.

——. The Volcanoes of the Haute Loire and the Ardèche. *Pop. Sci. Rev.* n. ser. vol. i. pp. 250–260, 329–341, pl. viii. map, woodcut.

Supplementary to the above. Describes the geology of the district, the contents of Museum at Le Puy, the Drifts of Polignac and Mt. Denise, the proofs of denudation, and changes of physical geography, and the geological distribution of existing plants. W. T.

Tardy, —. Quelques mots sur la rivière d'Ain et le Jura à l'époque miocène. [The Ain river and the Jura in the Miocene.] *Bull. Soc. Géol. France*, sér. 3, vol. iv. pp. 577–582.

The Ain existed, much in its present position, in Miocene times.

——. Une variété de puits dans la Craie du Pas-de-Calais. [Swallow-holes in the Calais Chalk.] *Bull. Soc. Géol. France*, sér. 3, t. iv. p. 583.

Refers to pits formed by the falling in of caverns.

Tombeck, —. Sur le Corallien de Lévigny, près Mâcon. [Corallian of Lévigny.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 556–559.
Establishes the Corallian age of the Lévigny stone.

Tournouer, —. [History of S.E. European Tertiaries.] *Naturforscher.* (Noticed in *Nature*, vol. xv. p. 542.)

Trautschold, H. Aus Esthland und vom Wolchov. [Esthonia and Wolchov.] *Bull. Soc. Imp. Nat. Mosc.* t. lii. pt. 1, pp. 367–378.
Remarks on Carboniferous and L. Silurian fauna.

Tromelin, Gaston de, and **Paul Lebesconte.** Observations sur les terrains primaires du Nord du département d'Ille-et-Vilaine et de quelques autres parties du massif breton. [Primary Rocks, Brittany.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 583–623.
Remarks on Cambrian, Silurian, Devonian, and Carboniferous rocks and their fossils. The "Grès de St. Germain-sur-Ille" is referred to the 2nd Fauna of the Silurian (Devonian). W. H. D.

Vilanova, J. [Important Function of Silica in Rocks: Kaolin in Toledo.] *Bull. Soc. Géol. France*, sér. 3, t. iv. pp. 679, 680.
Refers to Enhydros-agates, S. America, and kaolinized pegmatite, Spain.

PALÆONTOLOGY.

3. *PLANTS.*

Sub-Editor W. CARRUTHERS, F.R.S., F.G.S.

Aberle, Dr. C. Vergleichende Zusammenstellung der gebräuchlicheren Pflanzensysteme und statistische Uebersicht der Artenzahl und Verbreitung der Ordnungen (Familien) der lebenden und fossilen Gefässpflanzen. [Comparison of the usual Botanical Systems and Statistics of Size and Range of the Families of Recent and Fossil Plants.] Pp. 132. 8vo. *Vienna.*

Andrae, Dr. C. J. [Palæobotanical Notes.] *Verh. nat. Ver. preuss. Rheinl.* Jahrg. 34, *Sitz.* pp. 26–28, 57, *Corr.-Blatt*, p. 76.

1. Ferns from the Saarbrück coal-field noticed. 2. A branching alga from the Belgian Coal Measures described. 3. Identity of *Aspidites Silesiacus* with *Pecopteris plumosa.* 4. Coal-Measure Ferns. W. H. D.

Balfour, J. H. Remarks on the Fossils exhibited by Mr. Peach belonging to the genus *Staphylopteris*, Lesq. *Trans. Bot. Soc. Edin.* vol. xii. p. 176.

Supposes it to be allied to *Botrychium* or *Anemia.*

Burdon, R. J. Fossil Botany. *4th Rep. Winchester Coll. Nat. Hist. Soc.* pp. 21–26.

A general account of the past floras of the earth.

Carruthers, William. Description of a new Species of Araucarites from the Coralline Oolite of Malton. *Quart. Journ. Geol. Soc.* vol. xxxiii. p. 402, pl. xvii. Appendix to a paper by **Blake** and **Hudleston** (see p. 5).

Describes and figures *Araucarites Hudlestoni.*

——. Evolution and the Vegetable Kingdom. *Contemporary Review*, vol. xxix. p. 397.

Part of the Address to the Geologists' Association, published 1878.

Cash, W., and T. Hick. A Contribution to the Flora of the Lowe Coal Measures of the Parish of Halifax, Yorkshire. *Proc. Yorks Geol. Soc.* vol. vii. pt. 1, pp. 73–82.
On the plant-remains in the " Halifax Hard-bed Coal."

Christison, Robert. Notice of a Pinaceous Fossil recently found i Redhill Quarry, near Edinburgh. *Trans. Bot. Soc. Edin.* vol. xi pp. 167–174.
Deals chiefly with the physical condition in which these fossils occu

Contejean, Prof. Ch. Note sur la flore calcifuge de l'Albe de Würtemberg. [The " calcifuge " Flora of the Albe of Würtemberg. *Compt. Rend.* t. lxxxiv. pp. 785, 786.
The Albe of Würtemberg, although a limestone, is abnormally siliceous (sometimes reaching a percentage of 96 of silica), a fact whic accounts for the presence on it of several strictly " calcifuge " plants.
G. A. L

Conwentz, Hugo. Ueber die versteinerten Hölzer aus dem norddeutschen Diluvium. [Petrified Woods from the N. German Drift. *Inaugural Dissertation.* Pp. 33.

Dawson, J. W. Note on a Specimen of *Diploxylon* from the Coa Formation of Nova Scotia. *Quart. Journ. Geol. Soc.* vol. xxxiii pp. 836–842.
The trunk of a tree, 12 feet in height, preserved in place at the Sout Joggins. Considers *Diploxylon* to be a form of *Sigillaria.*

Debey, Dr. —. [Conifers of the Aix Chalk.] *Verh. nat. Ver Preuss. Rheinl.* Jahrg. xxxiv.; *Corr.-Blatt.* p. 110.

Engelhardt, H. Ueber die fossilen Pflanzen des Süsswassersandsteines von Tschernowitz; ein neuer Beitrag zur Kenntniss de fossilen Pflanzen Böhmens. [Fossil Plants of the Freshwate Sandstones of Tschernowitz, Bohemia.] *Nova Acta Ac. Cæs. Leop.-Car.* Bd. xxxix. pp. 1–66; 5 pls.
34 plants, not hitherto recorded from this locality, are added to th flora, together with the four new species *Attalea Goepperti*, *Myric Tschernowitziana*, *M. Credneri*, and *Fructus polyspermus.*

——. Bemerkungen über Tertiärpflanzen von Stedten bei Halle. [Tertiary Plants of Stedten near Halle.] *Sitz. Isis Dresden*, pp. 14–16.
List, with remarks.

——. Tertiärpflanzen von Kunzendorf bei Sagan in Schlesien. [Tertiary Plants from Kunzendorf, near Sagan, in Silesia.] *Sitz. Isis Dresden*, pp. 18–20.
List, with remarks.

Etheridge, Robert, Jun. Note on a Species of *Pothocites*, Paterson, in the Lower Carboniferous Rocks near West Calder. *Trans. Bot. Soc. Edin.* vol. xii. pp. 151, 152.

Several specimens of what is perhaps a new species of *Pothocites.*

——. On a new Locality for *Pothocites. Trans. Bot. Soc. Edin.* vol. xii. pp. 162, 163.

From the Pavement Quarry, Corstorphine Hill, near Edinburgh.

——. Note on the Geological Range of *Adiantites lindsææformis*, Bunb. *Trans. Bot. Soc. Edin.* vol. xii. pp. 229, 230.

From the L. Carboniferous beds of Edinburgh.

Ettingshausen, Dr. Const. von. Die fossile Flora von Sagor in Krain.—Theil II. [Fossil Flora of Sagor.] *Denkschr. k. Ak. Wiss.* Bd. xxxvii. pp. 161–216, pls. xi.–xxvii.; abstract in *Sitz. k. Ak. Wiss. Wien*, Bd. lxxiv. pp. 776–784.

The total number of species is 327; all are Tertiary. Many previously known species described and figured, as well as the following new ones—*Olea carniolica, Notelæa rectinervis, Fraxinus savinensis, F. palæo-excelsior, Apocynophyllum salicinum, A. angustum, A. tenuifolium, A. longe-petiolatum, A. breve-petiolatum, Alstonia carniolica, Myoporum Salicites, Heliotropites parvifolius, Myrsine eucalyptoides, M. savinensis, Sapotacites Heerii, S. longe-petiolatus, Chrysophyllum sagorianum, Bumelia Heliadum, Diospyros sagoriana, Symplocos savinensis, Andromeda sagoriana, Rhododendron sagorianum, Vaccinium Palæomyrtillus, Cussonia antiqua, Araliophyllum hederoides, A. crenulatum, A. asperum, A. Saportanum, Loranthus Palæo-Eucalypti, L. extinctus, L. Palæo-Exocarpi, Phthirusa Palæo-Theobromæ, Hydrangea sagoriana, H. dubia, Pterospermum sagorianum, Tetrapteris sagoriana, Banisteria carniolica, Malpighiastrum rotundifolium, Pittosporum palæo-tetraspermum, Elæodendron sagorianum, Zizyphus undulatus, Juglans rectinervis, Pistacia Palæo-Lentiscus, Rhus sagoriana, Ptelea intermedia, P. microcarpa, Vochysia europæa, Metrosideros europæa, Erythrina Ungeri, Dioclea protogæa, Styphnolobium europæum, Cæsalpinia Heerii, Cassia sagoriana*, and *C. denticulata.* W. H. D.

Fairchild, H. L. On the Variations of the Leaf-scars of *Lepidodendron aculeatum*, St. *Ann. N. York Acad. Sci.*

——. On the Variations of the decorticated Leaf-scars of certain *Sigillariæ. Ann. N. York Acad. Sci.*

Feistmantel, Dr. Ottokar. Ueber die indischen Cycadeengattungen *Ptilophyllum* und *Dictyozamites* (Oldh.). *Palæontographica*, Supp. iii. Lief. 3, pp. 1–23, pls. i.–vi.

A table is given of the plant-bearing formations of India in stratigraphical order according to the views of the author, and lists of the leading plants in each. The synonymy of the two genera is critically examined, their limits defined, and distribution noted. Of species formerly referred to *Ptilophyllum* (or *Palæozamia*) some are now removed to *Otozamites*. The following new varieties of *P. Cutchense* are distinguished —*distans, curvifolium, minimum*; *P. brevilamellatum* is a n. sp. The genus is confined to India. *Dictyozamites* is shown to be a cycad, and distinct from the fern *Dictyopteris*. The described species are now united into one, for which a new name, *D. indicus*, is framed. It occurs in the Rajmahal series [Lias f., Feistmantel]. E. B. T.

Feistmantel, Dr. O. Ueber die Gattung *Williamsonia* (Carr.) in Indien, nebst Bemerkungen über die Flora, mit der sie in den Schichten vergesellschaftet vorkommt. [The Genus *Williamsonia* in India, &c.] *Palæontographica*, Suppl. iii. part 3, pp. 21–51, pls. 1–3.

This Cycad genus appears earlier than in Europe; and the species have a longer range, which latter was also the case with *Ptilophyllum*. The position of the Indian plant-bearing beds is compared with the English, and a list of the flora in each given. The Kachh (Cutch) beds, or upper part of the Gondwana series, contain *Williamsonia Blanfordi*, and are ranked as Middle Jurassic. The Nurha beds are somewhat lower. The Jabalpur group contains *Williamsonia* cf. *gigas*, and is equivalent of the L. Oolite flora of Yorkshire. The Rajmahal series, with *Williamsonia microps* and *W.* cf. *gigas*, is of Lias age. E. B. T.

——. Notes on Fossil Floras in India. *Rec. Geol. Surv. Ind.* vol. x. pp. 68–76, 133–140, 196–203, pls. ix.–xix.

From the Atgarh sandstones, ferns and conifers, n. sp. *Rhizomopteris Balli*; from Damúda series, *Pterophyllum*, *Noeggerathia*, and *Macropterygium*; from Barákar group, *Equisetaceæ* and ferns; from the Ráníganj group near Assensole, *Vertebraria*, *Phyllotheca*, *Glossopteris*, and *Ganganopteris*.

A tree-fern stem from the Cretaceous rocks near Trinchinopoly is referred to a new genus *Protocyathæa*, which will include the form described by Unger as *Caulopteris cyatheoides* and the n. sp. *P. Trichinopoliensis*. From Karharbári several species of Equistaceæ, Filices, Cycadeæ, and Coniferæ. The occurrence of *Glossopteris* in the Panchet group and in the U. Gondwánas is noticed.

From Gondwána system two new species, *Ginkgo lobata* and *G. crassipes*. Some remarks on *Vertebraria*, *Schizoneura*, *Zeugophyllites*, and *Noeggerathia*. A note on the occurrence of *Glossopteris* (?) in the coal-bearing rocks of Asia Minor and in the Tertiary of Novale. F. D.

——. [The Jurassic Flora of Eastern Siberia and India.] *N. Jahrb.* pp. 626–629.

Letter on synonymy, &c.

Feistmantel, Dr. O. Ueber das Verhältniss gewisser fossilen Floren und Landfaunen untereinander und zu den gleichzeitigen Meeresfaunen in Indien, Afrika und Australien. [Relation of the Fossil Flora and Fauna of India, Africa, and Australia.] 8vo. *Calcutta.*

Föhr, K. F. Ueber einen neuen Fund im Keupersandstein. [New Discovery in the Keuper.] *Naturforscher*, no. 42, p. 398.

In addition to the plants belonging to Equisetaceæ, Coniferæ, and Cycadeæ, describes a new form, *Protocorollum Keuperinum,* intermediate between Monocotyledons and Dicotyledons.

Geyler, Dr. H. T. Ueber fossile Pflanzen aus der Juraformation Japans. [Jurassic Plants from Japan.] *Palæontographica*, Bd. xxiv. pp. 221–232, pls. 30–34.

16 species are described, of which 7 are ferns; several occur in Siberia and the Amoor territory; the following are new—*Thyrsopteris elongata, Pecopteris exiliformis, Zamites parvifolius, Podozamites tenuistriatus, P. Reinii, Cycadeospermum japonicum.* E. B. T.

Gilkinet, A. Sur quelques plantes fossiles de l'étage du Poudingue de Burnot (dévonien inférieur). [Plants of the Burnot Conglomerate, L. Devonian.] *Bull. Ac. Roy. Belg.* vol. xl. pp. 139–145; 3 pls. [1875.]

Filicites pinnatus is probably a Cycad. *F. lepidorhachis* is a *Lepidodendron*, for which the name *L. Burnotense* is proposed.

Goeppert, Dr. Ueber Araucarien der productiven Steinkohlen-Formation. [*Araucariæ* of Austrian Coal Measures.] *Schlesische Zeitung*, July 3.

Grand'Eury, F. C. Flore Carbonifère du Département de la Loire et du Centre de la France. [Carboniferous Flora of Central France.] *Mém. Acad. Sci. France*, t. xxiv. pp. 348; 38 pls.

Description of the St. Étienne Coal-flora, including many new species, for the names of which see INDEX OF NEW NAMES. Gives the restoration of an entire Calamite, *Calamocladus* (not *Asterophyllites*) being the branches, *Calamostachys* the fruit, *Calamorhiza* (new) the rhizome. *Calamophyllites* is the stem of *Asterophyllites, Endocalamites* the cast of its interior, and *Volkmannia* the fruit. Of *Annularia, Bruckmannia* is the fruit and *Pinnularia* the rootlets. *Equisetites* seems to have a hard sheath. Of *Pecopteris* the fructification of many is described. *Stipitopteris* (n. gen.) is a tree fern. *Psaronocaulon* (n. gen.) is a tree fern in which the scars are obscure or hidden by aerial roots. Of Neuropterid ferns, *Aulacopteris* is a new genus, and *Medullosa* the stem of a like fern. Of Lycopodiaceæ, *Pseudosigillaria* is a new genus, *Knorria* and *Halonia* being allies. In Gymnosperms are placed *Sigillariæ, Sigillariophyllum* being leaflets, *Sigillariocladus* (new) the branches, *Sigillariostrobus* the fruit, and *Stigmaria* the root. *Stigmariopsis* is the root of *Syringodendron*. *Schizostachys* is the inflorescence of a Noeggerathiad. Stems, roots, and restorations of *Cordaites* are given. The inflorescence of *Antholites* is named *Cordaianthus*; the seed *Cardiocarpus* is re-named *Cordaicarpus*, the branches *Cordaicladus*, of which *Sternbergia* (=*Artisia*) is the medullary cast; the bark is *Cordaiphloios*, the woody tissue *Dadoxylon*. *Dicranophyllum* (new) is adopted for bifurcate leaves, and *Botryconus* and *Samaropsis* are seeds and fruit-spikes of *Cordaites*. In the group Calamodendreæ *Arthropitys* is placed; the bark is *Calamodendrophloios*, and the root *Calamodendrea*, both names new. E. B. T.

Hassencaup, E. Geologisches aus der Umgebung von Fulda. [Geological Note on the Environs of Fulda.] *5th Ber. Ver. Naturk. Fulda*, pp. 21, 22.

Species of known plants are recorded from the Triassic rocks.

Heer, Dr. Oswald. Ueber permische Pflanzen von Fünfkirchen in Ungarn. [Permian Plants of Funfkirchen, Hungary]. *Jahrb. kön. ung. geol. Anst.* Bd. v. pp. 1–18; 4 plates.

11 species are described, 6 of which are fruits referred to *Carpolithes*.

Jack, H. K., and Etheridge, R., Jun. On the Discovery of Plants in the Lower Old Red Sandstone of the neighbourhood of Callander. *Quart. Journ. Geol. Soc.* vol. xxxiii. pp. 213–222.

Remains, supposed to belong to *Psilophyton*, described, and list of localities given.

Martins, Ch. Sur l'origine paléontologique des arbres, arbustes, et arbrisseaux indigènes du midi de la France sensibles au froid dans les hivers rigoureux. [The Palæontological Origin of the Trees and Shrubs indigenous to S. France, sensitive to cold in severe winters.] *Mém. Ac. Sci. Montpellier*, p. 77, pl. ix.

A comparison of these plants with fossil remains in Tertiary beds in France referred to the same species shows that the Tertiary period was warmer than the present, and the existing plants are the struggling descendants of the fossils.

Mueller, Ferd. von. Descriptive Notes on the Tertiary Flora of New South Wales. *Ann. Rep. Dept. Mines, N. S. Wales.* See above, p. 161.

The following new genera and species based on fruits are described—*Ochthodocarpon Wilkinsonii*, *Eisothecaryon semiseptatum*, *Illicites astrocarpa*, *Pentacoila Gulgonensis*, *Pleiacoon elachocarpum*, and *Acrocoila anodonta*; and to genera already known the following new species are added—*Phymatocaryon bivalve*, *Plesiocapparis leptocelyphis*, and *Spondylostrobus Smythii*, var. *Cryptaxis*. R. E., Jun.

Mueller, Ferd. von. Description of Fossil Fruits in Siliceous Deposits, Richmond River. *Journ. R. Soc. N. S. Wales*, vol. x. pp. 239, 240, plate.

Liversidgea oxyspira, a new species and genus, with affinities, it is believed, to Rutaceæ, Guttiferæ, Capparideæ, and Bixaceæ.

Munier-Chalmas, —. Observations sur les Algues calcaires appartenant au groupe des Siphonées verticillées (*Dasycladées*, Harv.) et confondues avec les Foraminifères. [Calcareous Algæ mistaken for Foraminifera]. *Compt. Rend.* t. lxxxv. pp. 814–817.

Groups the following 7 families together under the *Siphoneæ verticillatæ*:—Cymopolidæ, Acetabularidæ, Thyrsoporellidæ, Dactyloporidæ, Neomeridæ, Uteridæ, Hagenmülleridæ. The Foraminifera chiefly affected by these altered views reached their numerical maximum in Secondary and Tertiary times. G. A. L.

Nathorst, A. G. Ginkgo Familiens fossile Repræsentanter. [Fossil Representatives of the Ginkgo Family.] *Tidskrift for populære Fremstillinger af Naturvidenskaberne*, Række 5, Bind 4, pp. 132–141; 8 woodcuts. *Copenhagen.*

Popular description of the only species now living in China, *Ginkgo biloba*, and of its fossil representatives from the Tertiary, Cretaceous, and Jurassic, as well as of the genera *Baiera* and *Czecanowskia*. E. E.

Peach, C. W. Notice of a new Lepidodendroid fossil from Devonside, Tillicoultry, with remarks on other fossil Plants: *Trans. Edin. Bot. Soc.* vol. xii. pp. 99–101.

On specimens of *Megaphyton*, *Lepidodendron*, and *Favularia*.

——. Notes on some fossil plants from the shales of West Calder. *Trans. Bot. Soc. Edin.* vol. xii. p. 162.

Specimens of *Sphenopteris affinis* and other plants described.

——. Remarks on specimens of *Ulodendron* and *Halonia* from West Calder. *Trans. Edin. Bot. Soc.* vol. xii. pp. 174, 175.

Several species referred to, and one with a double row of scars provisionally named *U. scoticum*.

——. Remarks on specimens of some Fossil Plants. *Trans. Edin. Bot. Soc.* vol. xii. p. 187.

On *Sphenopteris affinis*, *Staphylopteris*, and the cones of *Lepidodendron*.

Peach, C. W. On Fossil Plants from the Calciferous Sandstone round Edinburgh. *Trans. Edin. Bot. Soc.* vol. xiii. pp. 46–48.

Notices the occurrence of 7 species common to Edinburgh and the Culm beds of the Continent; among them are *Adiantites antiquus* and *Rhacopteris paniculifera* not, previously noted. E. B. T.

——. On Circinnate Vernation of *Sphenopteris affinis*, and on the Discovery of *Staphylopteris*, a genus new to British Rocks. *Rep. Brit. Assoc.* for 1876, *Sections*, pp. 94, 144.

The fossils described are from the oil-shales of West Calder.

Renault, B. Nouvelles Recherches sur la structure des *Sphenophyllum* et leurs affinités botaniques. [Structure and Affinities of *Sphenophyllum.*] *Ann. Sci. Nat. Bot.* vol. iv. pp. 276–311; 3 plates.

Examines the views put forward, and the light thrown on them by the structure of the fossils, and considers that *Salvinia* is the nearest living ally. W. C.

——. Fleurs mâles des *Cordaites*; Fleurs femelles des *Cordaites.* [Flowers of *Cordaites.*] *Compt. Rend.* t. lxxxiv. pp. 782–785, 1328–1331.

Details of structure.

——. Sur les débris organisés contenus dans les quartz et les silex du Roannais. [Organic Remains in Quartz and Chert of the Roannais.] *Compt. Rend.* t. lxxxv. pp. 715–717.

List of plant-remains.

Rolle, Fried. Ueber ein Vorkommen fossiler Pflanzen zu Obererlenbach in der Wetterau. [Occurrence of Fossil Plants at Obererlenbach in Wetterau.] *N. Jahrb.* pp. 769–783.

Several Tertiary plants are referred to their genera.

Saporta, Count Gaston de. Sur la découverte d'une plante terrestre dans la partie moyenne du terrain Silurien. [Discovery of a Terrestrial Plant in M. Silurian strata.] *Compt. Rend.* t. lxxxv. pp. 500, 501.

A fern, related to the Cyclopterids and Palæopterids of the U. Devonian and Lowest Carboniferous rocks, found in the *Calymene Tristaui* beds of the Angers slates.

——. Découverte de plantes fossiles tertiaires dans le voisinage immédiat du pôle nord. [Discovery of Tertiary Plants near the North Pole.] *Compt. Rend.* t. lxxxv. pp. 561–563.

From an examination of the plants brought by Feilden from Grinnell's Land, considers that the polar climate was like that existing in Central Europe.

Saporta, Count G. de, and — **Marion.** Revision de la Flore Heersienne de Gelinden. 14 pls. 4to. *Brussels.* [Examination of the Heersian flora of Gelinden.] Report on this paper by **C. Malaise**, *Bull. Ac. R. Belg.* sér. 2, t. xliii. pp. 720–729.

Schenk, A. [Plants from the Slate-Quarries of Gräfenthal.] *N. Jahrb.* pp. 279, 280.

Letter on 3 ferns.

Smith, W. G. [Palæozoic Fungus.] *Gardeners' Chronicle*, Oct. 20. See also *Academy*, Nov. 17, p. 475.

Describes and figures *Peronosporites antiquarius*, found in a Carboniferous *Lepidodendron.*

Steudel, —. Sur un échantillon d'*Hypnum sarmentosum* découvert à Schussenried. *Bull. Soc. Acad. Boulogne*, t. ii. p. 200.

Stur, Dion. Beiträge zur Kenntniss der Flora der Vorwelt. Band I. Die Culm-Flora. Heft ii. Die Culm-Flora der Ostrauer und Waldenburger Schichten. [Culm-Flora of Ostrau and Waldenburg Beds.] *Abh. k.-k. geol. Reichs.* Bd. viii. Heft 2, pp. xiv, 366 (107–472), pls. A (map, not geol.), B, C (geol. sections across coalfield), xviii.–xxix. (fossils). Continuation of work noticed in the GEOLOGICAL RECORD for 1875, p. 340.

Pp. 1–316 are occupied by descriptions of the flora; pp. 317–350 by notes on the literature, and distribution of fossils in the series; 350–352, analyses of the Ostrau coal by **E. Hanke**; 352–355, unconformity in the Ostrau coalfield: 358–366, results. The names of plants described without reference to previous publications and presumably new are given in the INDEX OF NEW NAMES. W. H. D.

——. Ist das *Sphenophyllum* in der That eine Lycopodiaceae? [Is *Sphenophyllum* a Lycopod?] *Jahrb. k.-k. geol. Reichs.* Bd. xxviii. pp. 7–32.

Sphenophyllum has been placed among the Lycopods by Schenk, partly because of the sporangia being set on the base of the bracts. This opinion is controverted, and it is shown that both in *Equisetum* and *Calamites* [*Eleutherophyllum*] the sporangium may be on the upper or inner side of the bract. The fact of a *Bruckmannia* and a *Volkmannia* occurring on the same stem is noticed; so that they cannot be distinct genera: these, and analogous cones, *Calamostachys* &c. may all be special states of *Calamites.* E. B. T.

——. Pflanzenreste aus dem Rhät von Pälsjö in Schonen, ein Geschenk des Hrn. Dr. A. G. Nathorst. [Plants from the Rhætic of Palsjö, in Scania.] *Verh. k.-k. geol. Reichs.* pp. 35–38.

Remarks on the work of Dr. Nathorst (1876), with a letter from him.

Stur, Dion. Zwei Notizen über die Araucariten im nordöstlichen Böhmen. [Two Notices of the Araucarites of N.E. Bohemia.] *Verh. k.-k. geol. Reichs.* pp. 237–240.

Remarks on Dr. Goeppert's work (see above, p. 373), and on a further discovery by the same of *Araucarites Schrollianus.*

Weiss, Ch. E. Ueber die Entwickelung der fossilen Floren in den geologischen Perioden. [Evolution of Fossil Plants.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 252–258.

Refers to the succession of floras from the Silurian to recent times.

——. Ueber neuere Untersuchungen an Fructification der Steinkohlen-Calamarien. [Fructification of Carboniferous *Calamites.*] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. pp. 259–273.

A review of views published on these fossils since the author's work in 1876.

——. Pflanzenabdrücke aus dem Rothliegenden zwischen Langwaltersdorf und Lässig bei Gottesberg in Schlesien. [Impressions of plants in the Rothliegende between Langwaltersdorf and Lässig.] *Zeitsch. deutsch. geol. Ges.* Bd. xxix. p. 426.

13 species of plants recorded.

Williamson, Prof. W. C. On the Organization of the Fossil Plants of the Coal Measures. Part viii. Ferns and Gymnospermous Stems and Seeds. *Phil. Trans.* vol. clxvii. pp. 213–270, plates 5–16.

The full text of the memoir noticed in the GEOLOGICAL RECORD for 1876, p. 311.

——. On the Organization of the Fossil Plants of the Coal-measures. Part IX. On the latest Researches into the Organization of the Fossil Plants of the British Coal-measures, especially of the Calamites and Lepidodendra. *Proc. R. Soc.* vol. xxvi. p. 411.

——. Recent Researches into the Organization of some Plants of the Coal Measures. *Rep. Brit. Assoc.* for 1876, *Sections*, p. 98.

On the structural identity of *Calamites* and *Calamodendron*, and of *Lepidodendron* and *Sigillaria.*

See also :—

Mueller, Ferd. von. New Vegetable Fossils, Victoria: p. 163.

SUPPLEMENT FOR 1874–1876.

Baily, W. H. On Fossils from the Upper Old Red Sandstone of Kiltorcan Hill, in the County of Kilkenny. *Proc. R. Irish Acad.* ser. 2, vol. ii. pp. 45–48. [1875.]

A notice of the plants and other fossils.

Binney, E. W. Observations on the Structure of Fossil Plants found in the Carboniferous Strata.—Part IV. *Sigillaria* and *Stigmaria*. Pp. 97–147, pls. xix.–xxiv. *Pal. Soc.* [1875.]

Contains general remarks on *Sigillaria*, *Anabathra*, *Diploxylon*, and *Stigmaria*; Bibliography; and some further information respecting *Sigillaria vascularis* and *Stigmaria ficoides*. R. B. N.

Brongniart, A. Note sur les plantes fossiles de Tinkiako (Shensi méridional) envoyées en 1873 par M. l'Abbé David. [Fossil Plants, China.] *Bull. Soc. Géol. France*, sér. 3, t. ii. p. 408. [1874.]

Notes 5 forms identical with or allied to British Jurassic species.

Engelhardt, H. [Tertiary Plants, Bohemia.] *Nova Acta Ac. Cæs. Leop.-Car.* Bd. xxxviii. pp. 343–417, pls. xvi.–xxvii. Title in GEOLOGICAL RECORD for 1876, p. 302.

Depazea Lomatiæ, *Xylomites Peneæ*, *Lomatia Heeri*, *Weinmannia glabroides*, *Rhamnus Castellii*, *Leguminosites Geinitzi*, *Cyperites Wolfinavi*, and *Diospyros macrocarpos* are new species. W. H. D.

Feistmantel, Carl. Beitrag zur Steinkohlenflora von Lahna. [Carboniferous Flora of Lahna.] *Lotos*, Nov. 1875.

Notes 24 species. Locality between Kladno and Rakonitz, Bohemia.

Feistmantel, O. Ueber Baumfarrenreste der böhmischen Steinkohlen-, Perm-, und Kreideformation. *Abh. k. böhm. Ges. Wiss.* Folge 6, Bd. vi. p. 1. [1874.]

——. Kleine paläontologische Mittheilungen. Charakter der älteren Landflora oder Gemeinschaftlichkeit der Landflora in den paläozoischen Gebirgsgliedern. [Palæozoic Flora.] *Lotos*, p. 1. [1874.]

Feistmantel, O. Ueber Steinkohlenpflanzen aus Portugal. [Carboniferous Plants from Portugal.] *Lotos.* [1875.]

Goeppert, —. Ueber die Beziehungen der Stigmaria zu Sigillarien der Steinkohlenformation. [Relation of *Stigmaria* to *Sigillaria.*] 52. *Jahresb. Schles. Ges. Cultur,* p. 37. [1875.]

Gurlt, —. Ueber Farnreste aus dem Thonschiefer von Tergove in der kroatischen Militärgrenze. [Ferns from Clay-Slate of Tergove, Croatia.] *Verh. nat. Ver. preuss. Rheinl.* Jahrg. xxxii. *Sitzungsb.* p. 124. [1875.]

Heer, Dr. Oswald. Flora Fossilis Helvetiæ. Die vorweltliche Flora der Schweiz. [Fossil Flora of Switzerland.] Lief. I. Die Steinkohlen. [Carboniferous.] Pp. 44; 22 pls. Fol. *Zurich.* [1876.]
Describes many species, of which the following are new—*Cyclopteris ciliata*, *Neuropteris montana*, *Odontopteris Studeri*, *Callipteris valdensis*, *Lepidophyllum caricinum*, *L. setaceum*, *L. Leberti*, *L. trigeminum*, *L. trilineatum*, *L. anceps*, and the n. gen. *Distrigophyllum.* W. H. D.

Laurance, J. On some Remarkable Specimens of Fossil Fruit recently discovered in the Coal Formation. *Trans. Leicester Lit. Phil. Soc.* pt. i. pp. 22–25. [1876, read 1837.]
Refers to specimens from the Coal Measures of Bolton, Lancashire, and the inferences drawn from them.

Martins, C. Sur l'origine paléontologique des arbustes et arbrisseaux indigènes du midi de la France sensibles au froid dans les hivers rigoureux. [Paleontological Origin of the less hardy Shrubs of S. France.] *Act. Soc. Helv. Sci. Nat.* ann. 59. [1876.] (See above, p. 374.)

Morris, Prof. John. 'The Cretaceous Flora.' *Pop. Sci. Rev.* vol. xv. pp. 46–59. [1876.]
Reviews the Cretaceous floras of Europe, Greenland, America, and New Zealand, and shows that each of the floras has a more or less local character. Remarks on the great difference between the U. and L. Cretaceous floras (the former being marked by the abundance of dicotyledons), and gives a table showing the distribution of plants and fishes in time. W. C.

Oldham, T., and J. Morris. The Fossil Flora of the Rájmahal Series, Rájmahal Hills, Bengal. *Mem. Geol. Surv. Ind., Palæontologia Indica,* fasc. 5, pp. 33–40, pls. xxv.–xxx. [1874.]
The following new species are described and figured—*Stangerites M'Clellandi* (O. & M.), *S. ensis* (O.), *Dictyopteris falcata* (M.), and var. *obtusifolia* (M.). R. B. N.

Renault, B. Affinités botaniques du genre Nevropteris. [Botanical Relations of *Neuropteris.*] *Compt. Rend.* t. lxxxiii. pp. 399–41. [1876.]

——. Recherches sur les végétaux silicifiés d'Autun et de Saint-Etienne. Des Calamodendrées et de leurs affinités botaniques probables. [Fossil Plants of Autun and St. Etienne, *Calamodendra.*] *Compt. Rend.* t. lxxxiii. pp. 546–549. [1876.] See GEOLOGICAL RECORD for 1876, p. 309.

Redescribes *Calamodendron striatum*, Unger, and *Arthropitys* (*C. bistriatum*), Mougeot.

——. Recherches sur quelques Calamodendrées et sur leurs affinités botaniques probables. [Affinities of *Calamodendron.*] *Compt. Rend.* t. lxxxiii. pp. 574–576. [1876.]

Notes on *Arthropitys* and *Calamodendron,* giving generic and specific characters.

Saporta, Count Gaston de. Sur la présence d'une Cycadée dans le dépôt miocène de Koumi (Eubée). [Cycad in the Miocene of Eubœa.] *Compt. Rend.* t. lxxviii. p. 1318–1321. [1874.]

Describes *Encephalartos Gorceixianus.*

——. Paléontologie Française. Sér. 2. Végétaux. Terrain Jurassique. Livr. 15, 16. Cycadées, t. ii. f. 13–16, pls. 27–42. [1874.]

——. Paléontologie Française. Sér. 2. Végétaux. T. iii. Terrain Jurassique. Livr. 20. Conifères ou Aciculariées. [Jurassic Coniferæ.] Pp. 1–48, pls. cxxix.–cxxxvi. [1876.]

A part of an introduction to the study of Jurassic Conifers.

Stur, D. Reiseskizzen. [Journey Notes.] *Verr. k.-k. geol. Reichs.* pp. 261–289. [1876.]

Letters xii., xiv., xvii.–xxi. consist of remarks on the fossil plants in German museums. Letter xv. notes the fauna and flora of the Westphalian coalfield. W. H. D.

——. Weitere Pflanzenreste aus dem Kohlenbergbaue bei Kounowa im Kladno-Schlauer Becken. [More Plant-remains from the Kounowa Colliery, Bohemia.] *Verh. k.-k. geol. Reichs.* pp. 352, 353. [1876.]

3 species, proving the beds to be Carboniferous.

Waters, A. W. Notes on fossil *Lithothamnia*, so-called Nulliporæ.] *Mem. Lit. Phil. Soc. Manch.* ser. 3, vol. v. pp. 244–251. [1876.]

Refers to the important deposits produced by *Lithothamnia* in the Tyrolese Tertiaries, describes their internal structure and form, and quotes Gümbel's analysis, about 94 $CaCO_3$ and 5·5 MgC_3. W. H. D.

Williamson, Prof. W. C. On the Organization of *Volkmannia Dawsoni*, an undescribed Verticillate Strobilus from the Lower Coal Measures of Lancashire. *Mem. Lit. Phil. Soc. Manch.* ser. 3, vol. v. pp. 28–40, pls. i.–iii. [1876.]

Zeiller, R. Note sur les Plantes fossiles de la Ternera (Chili). [Fossil Plants, Chili.] *Bull. Soc. Géol. France*, sér. 3, t. iii. pp. 572–574, pl. xvii. [1876.]

Describes *Pecopteris Fuchsi*, n. sp., from Jurassic beds.

——. Note sur quelques troncs de Fougères fossiles. [Fossil Tree Ferns.] *Bull. Soc. Géol. France*, sér. 3, t. iii. pp. 574–579, pls. xvii., xviii. [1876.]

Describes *Caulopteris bipartita* and *C. Hasseloti*, n. sp., from Coal Measures and Grès bigarré respectively (the latter from near Baccarat).

INDEX OF NEW NAMES.

The following abbreviations of stratigraphical divisions are used, besides others which need no explanation:—

Cor. ... Corallian.
G. R.... Green River Beds, Eocene.
Poik.... Poikilitic (Permian *or* Trias).
Sarmat. ...... Sarmatian.
Tith. .... Tithonian.

New generic names are printed in this type.

Species figured, but not described, are marked by an asterisk *.

Names not given as new in titles or abstracts are ignored as presumably not new.

In the Index of New Species of the Geological Record for 1876 the following corrections should be made:—

To the notice of the paper describing the new genus *Pteranodon* (Marsh, p. 261) add the species *P. gracilis* and *P. longiceps*, and enter these in Reptilia.

In Lamellibranchiata add *Aviculopecten Clarkei* and *Conocardium Sowerbii*, both de Koninck, Dev., 281. Add * to the following genera (as new):—***Mortoniceras*** (Cephalopod), ***Cothocrinites*** (misspelt; Echinoderm), ***Diplaræa***, ***Epistreptophyllum***, and *Haplaræa* (Actinozoa), and *Dictyomitra* (Polycystin).

In the last entry (3rd column) on p. 382, for 287 read 285.

FORMATIONS.

Atlantosaurus Beds, *Marsh*, U. Jurassic, 291.
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† Preoccupied, changed to Krennerite by *Rath*, p. 248.

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Gibbula æquisulcata, Clarkei, & crassigranosa, *Woods*, Tert., 324.
Gundlachia Francofurtana, *Böttger*, Mioc., 301.
Gyrodes contracta, *Gabb*, Lias, 309.
—— depressa, *Meek*, Cret., 315.
—— lirata, *Gabb*, Cret., 309.
Gyrotropis squamosus, *Gabb*, Cret., 309.
Helcion carbonarius, *Gabb*, Lias, 309.
—— Meyeri, *Gardner*, Neoc., 310.
Helix aziospudasta & calyptogyra, *Filhol*, Eoc., 308.
—— morrisii, *Wood*, Eoc., 324.
—— naninopsis & subnanina, *Filhol*, Eoc., 308.
—— subteres, *Clessin*, Tert., 304.
Hipponyx neocomiensis, *Gardner*, Neoc., 310.
Homotoma erinaceus, ligustica, Michaudi, & Montagui, *Bellardi*, Plioc., 300.
—— producta, *Bellardi*, Mioc., 300.
—— Raynevali, *Bellardi*, Plioc., 300.
—— Soldanii & Tapparonii, *Bellardi*, Mioc., 300.
—— tumens, *Bellardi*, Plioc., 300.
Hyalina Böttgeriana, *Clessin*, Tert., 304.
Hybocystis Bourguignatiana, Chatiniana, Desnoyersiana, & europæa, *Filhol*, Eoc., 308.
—— Filholi, *Bourguignat*, Eoc., under *Filhol*, 308.
—— Milne-Edwardsiana, *Filhol*, Eoc., 308.
Hydrobia Avisanensis, *Fontannes*, Tert., 107.
Laxispira lumbricalis, *Gabb*, Cret., 309.
Leucochroa Milne-Edwardsiana, *Filhol*, Eoc., 308.
Limnaea Filholi, *Bourguignat*, Eoc., under *Filhol*, 308.
—— Heriacensis, *Fontannes*, Tert., 107.
—— Kingii, *Meek*, Tert., 315.
—— Milne-Edwardsiana, *Filhol*, Eoc., 308.
—— Undorfensis, *Clessin*, Tert., 304.
Liotia lamellosa, *Woods*, Tert., 324.
Loxonema acutissima & difficilis, *Koninck*, Carb., 313.
Lunatia suturalis, *Hutton*, Tert., 312.
Maclurea minima, *Hall & Whitfield*, Sil., 311.
Mangelia Biondii & contracta, *Bellardi*, Plioc., 300.
—— gracililirata, *Woods*, Tert., 324.
—— longa & Monterosati, *Bellardi*, Mioc., 300.
Margarita Kekwickii, *Woods*, Tert., 324.
Marginella octoplicata, strombiformis, & Wentworthii, *Woods*, Tert., 324.
Melania macedonica, *Burgerstein*, Plioc., 57.
Murchisonia tramontana, *Stache*, Perm., 320.
Murex (Deshayesi), var. prisca, *Rutot*, Oligoc., 318.
—— Eyerei, *Woods*, Tert., 324.
—— Reedii, *Wood*, Plioc., 323.
Nassa compta, *Hutton*, Tert., 312.
—— globosa, *Gabb*, Cret., 309.
Natica cadorica & comelicana, *Stache*, Perm., 320.
—— felina, *Blake & Hudleston*, Cor., 301.
Natica Lelia, *Hall & Whitfield*, Jur., 311.
—— Marchamensis, *Blake & Hudleston*, Cor., 301.
—— pusiuncula, *Stache*, Perm., 320.
—— vixumbilicata, *Woods*, Tert., 324.
Neptunæa costatus, *Hutton*, Tert., 312.
Neritina Forbesi, *Wood*, Eoc., 324.
—— Neumayri, *Burgerstein*, Plioc., 57.
—— zonula, *Wood*, Eoc., 324.
Oligotoma mirabilis, *Bellardi*, Mioc., 300.
Otopoma Filholi, *Bourguignat*, Eoc., under *Filhol*, 308.
Patella Delphinensis, Tournoueri, & Vindasmia, *Fontannes*, Tert., 107.
Perissolax trochoides, *Gabb*, Cret., 309.
Petropoma Peruana, *Gabb*, Lias, 309.
Physa Copei, *White*, Tert., 323.
Pileopsis dubia, *Gardner*, Cret., 310.
—— neocomiensis, *Gardner*, Neoc., 310.
—— Seeleyana, *Gardner*, Cret., 310.
Planorbis Albertanus, angulatus, & subfontanus, *Clessin*, Tert., 304.
Pleurotoma Archimedis, bellatula, Bronni, caperata, captata, carcarensis, cavata, citima, coronifera, decorata, desita, distorta, flammulata, Galvinii, & Giebeli, *Bellardi*, Mioc., 300.
—— Johnstoni, *Woods*, Tert., 324.
—— multistriata & nuda, *Bellardi*, Mioc., 300.
—— paracantha, *Woods*, Tert., 324.
—— pinguis, *Bellardi*, Mioc., 300.
—— pullulascens & sandleroides, *Woods*, Tert., 324.

Pleurotoma Serresi, sororcula, striatissima, stricta, subcoronata, subecostata, & subnuda, *Bellardi*, Mioc., 300.
Pleurotomaria helicinæformis & humilis, *Koninck*, Carb., 313.
—— Scacchi & trochotomopsis, *Gemmellaro*, Lias, 330.
—— turrita, *Zareczny*, Tith., 119.
—— Woodsi, *Johnson*, Tasmanite, 160.
—— Zeuschneri, *Zareczny*, Tith., 114.
Pomatias Filholi, *Bourguignat*, Eoc., under *Filholi*, 308.
—— lamellosus, *Wood*, Eoc., 324.
Prisconatica ampla, inconspicua, & ovoidea, *Gabb*, Cret., 309.
Prososthenia crassa, nodosa, reticulata, & Suessii, *Burgerstein*, Plioc., 57.
Pseudotoma connectens, oligocenica, pinnata, præcedens, semirugosa, & striolata, *Bellardi*, Mioc., 300.
Ptychosyca inornata, *Gabb*, Cret., 309.
Puncturella antiqua, *Gardner*, Cret., 310.
Raphistoma acuta, *Hall & Whitfield*, Sil., 311.
—— alifera & angulifera, *Bellardi*, Mioc., 300.
—— Appeliusi & beliformis, *Bellardi*, Plioc., 300.
—— Calandrellii, *Bellardi*. Mioc., 300.
—— detexta, *Bellardi*, Plioc., 300.
—— inæquicostata & Jeffreysi, *Bellardi*, Mioc., 300.
—— Libassii, *Bellardi*, Plioc., 300.
—— lirifera & novella, *Bellardi*, Mioc., 300.
—— pulchra, *Bellardi*, Plioc., 300.
—— pungens, Rissii, Semperi, & testæ, *Bellardi*, Mioc., 300.
Raphistoma vellicata, *Bellardi*, Plioc., 300.
—— Weinkauffi, *Bellardi*, Mioc., 300.
Rissoa Stevensiana, *Woods*, Tert., 324.
Rissoina concatenata, Johnstoni, Tateana, & varicifera, *Woods*, Tert., 324.
Rouaultia bicoronata, *Bellardi*, Mioc., 300.
Scalaria anomala, *Stearns*, Tert., 333.
—— curvilamella, *Vincent*, Eoc., 334.
—— cyclostoma, *Gabb*, Cret., 309.
—— Goryi, *Lartet*, Cret., 142.
—— Servaisi & tenuicosta, *Vincent*, Eoc., 334.
—— Thomasi, *Gabb*, Cret., 309.
—— varicostata, *Stearns*, Tert., 333.
Scurria calyptræiformis & depressa, *Gardner*, Neoc., 310.
Sigaretus carinatus, *Hutton*, Tert., 312.
Solarium gibbuloides, *Woods*, Tert., 324.
Surcula anomala, avia, Bardini, Cocconii, consobrina, Destephanii, diademata, Forestii, Kossuthii, Lathyriformis, Mercatii, multifilosa, Perezi, perlonga, & polliæformis, *Bellardi* Mioc., 300.
—— strigosa, *Gabb*, Cret., 309.
—— terebræformis, *Bellardi*, Mioc., 300.
Tectura formosa & plana, *Gardner*, Neoc., 310.
Tenagodus occlusus, *Woods*, Tert., 324.
Terebra additioides, *Woods*, Tert., 324.
Thalia marginata, *Woods*, Tert., 324.
Thalotia alternata, *Woods*, Tert., 324.
Triphoris Voguei, *Lartet*, Cret., 142.
Triton fusiforme, *Vincent*, Eoc., 334.
—— minimum, *Woods*, Tert., 324.
Tritonium edentatum, *Gabb*, Cret., 309.
Trochus aytonensis, *Blake & Hudleston*, Cor., 301.
—— Josephi, *Woods*, Tert., 324.
—— Scherinus, *Gemellaro* Lias, 330.
Turbinella brevirostris, *Hutton*. Tert., 312.
Turbo Barboti, *Toula*, Sarmatian, 99.
—— Etheridgei, *Woods*, Tert., 324.
Turbonilla liræcostata, *Woods*, Tert., 324.
—— montis-crucis, *Stache*, Perm., 320.
—— pagoda, *Woods*, Tert., 324.
Turritella concava & haustator, *Hutton*, Tert., 313.
—— Maussi, *Lartet*, Cret., 142.
—— Peruana, *Gabb*, Cret., 309.
—— Raimondii, *Gabb*, Lias, 309.
—— Reyi & Seetzeni, *Lartet*, Cret., 142.
—— Sturtii, *Woods*, Tert., 324.
—— Valriacensis, *Fontannes*, Tert., 107.
—— Warburtonii, *Woods*, Tert., 324.
Typhis (fistulosus) var. priscus, *Rutot*, Oligoc., 318.
—— hebetatus, *Hutton*, Tert., 312.
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Vermetus conohelix, *Woods*, Tert., 324.
Voluta M'Coyi, *Woods*, Tert., 324.
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Anodonta propatoris, *White*, Tert., 323.
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—— ractiformis, *Meek*, Cret., 315.
—— trigonopsis, *Hutton*, Tert., 312.
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Anthracosia gigantea, *Goldenberg*, Carb., 311.
Aphanaia gigantea, *Koninck*, Carb., 313.
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—— ovalis, *Gabb*, Cret., 309.
Astarte arenosa, *Hall & Whitfield*, Jur., 311.
—— subdepressa, *Blake & Hudleston*, Cor., 301.
Avicula decipiens, Hardyi, & intumescens, *Koninck*, Carb., 313.
—— lævis & pteropernoides, *Blake & Hudleston*, Cor., 301.
—— sublunulata, *Koninck*, Carb., 313.
Aviculopecten augustensis, *Hall & Whitfield*, Jur., 311.
—— catactus, *Meek*, Carb., 315.
—— curto-cardinalis, *Hall & Whitfield*, Carb., 311.
—— densicostata, *Trautschold*, Cret., 321.
—— Hardyi, *Koninck*, 313.
—— occidaneus, *Meek*, Carb., 315.
—— parvulus, *Hall & Whitfield*, Carb., 311.
—— profundus, *Koninck*, Carb., 313.
—— subconoideus, *Etheridge*, Carb., 329.
—— Weberensis, *Hall & Whitfield*, Carb., 311.
Axinæa Wyomingensis, *Meek*, Cret., 315.
Xenophora Peroni, *Locard*, Tert., 314.

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Camptonectes pertenuistriatus, *Hall & Whitfield*, Jur., 311.
Cardiomorpha gryphoides & striatella, *Koninck*, Carb., 313.
Cardita bisulcata, *Trautschold*, Cret., 321.
—— circularis, *Gabb*, ? Cret., 309.
—— gracilicostata, *Woods*, Tert., 324.
Cardium appressum, *Gabb*, Lias, 309.
—— Combei & (Hillanum) var. Moabiticum, *Lartet*, Cret., 142.
—— Timokii, *Toula*, Sarmatian, 99.
Chama Coquandi & Gasoli, *Vidal*, Cret., 101.
—— lamellifera, *Woods*, Tert., 324.
Chione propinqua, *Woods*, Tert., 324.
Clarkia, *Koninck*, Carb., 313.
Clavagella Brochoni & Cenonensis, *Benoist*, Mioc., 300.
Conocardium reticulatum, *Krause*, Sil., 314.
Corbula Escoffieræ, *Fontannes*, Tert., 107.
—— nuculoides, Peruana, & Raimondii, *Gabb*, Lias, 309.
—— sulcata, *Hutton*, Tert., 312.
Crassatella caudata, *Gabb*, Lias, 309.
—— Falconeri, *Lartet*, Cret., 142.
Cucullæa Cainozoica, *Woods*, Tert., 324.
—— Haguei, *Meek*, Jur., 315.
—— obliqua, *Meek*, Cret., 315.
—— obtusangula, *Trautschold*, Cret., 321.
Cultellus cenonensis, *Benoist*, Mioc., 300.
Zizyphinus Blaxlandi, *Woods*, Tert., 324.
Cyclas tumidula *Wood*, Eoc., 324.
Cypricardia glabra, *Blake & Hudleston*, Cor., 301.
—— globulosa, *Locard*, Tert., 314.
Cyprina Haueri, *Teller*, Cret., 321.
—— rectopalliata, *Nikitin*, Jur., 366.
—— tancrediformis, *Blake & Hudleston*, Cor., 301.
Cyrena anceps, pullastra, strigosa, tenera, & tumida, *Wood*, Eoc., 324.
Edmondia intermedia, *Koninck*, Carb., 313.
—— myrina, *Hall & Whitfield*, Trias, 311.
—— nobilissima, *Koninck*, Carb., 313.
—— Piñonensis, *Meek*, Dev., 315.
Ensis Basteroti, *Benoist*, Mioc., 300.
Euchondria, *Meek*, 331.
Gari elliptica, *Gabb*, Cret., 309.
Gastrochæna carinata, *Blake & Hudleston*, Cor., 301.
—— Dufrenoyi & Hörnesi, *Benoist*, Mioc., 300.
Gryphæa subgibbosa, *Blake & Hudleston*, Cor., 301.
Haploscapha excentrica & grandis, *Conrad*, Cret., 328.
Hippurites Maestrei & Montsecanus, *Vidal*, Cret., 101.
Homomya incurva & ponderosa, *Gabb*, Cret., 309.
Idonearca Alabamensis, Carolinensis, & Littlei, *Gabb*, Cret., 309.
Inoceramus erectus, *Meek*, Cret., 315.
Jouannetia Tournoueri, *Locard*, Tert., 314.
Leda crebricostata, *Woods*, Tert., 324.

Leda Grovei, *Lartet*, Cret., 142.
—— peraffinis, *Seguenza*, Mioc., 319.
—— semiteres, *Hutton*, Tert., 312.
—— Traquairii, *Etheridge*, Carb., 329.
Leptodomus clavatus, *Etheridge*, Carb., 329.
Lima Bassii, *Woods*, Tert., 324.
—— erecta, *Meek*, Jur., 315.
—— Liasina, *Gemmellaro*, Lias, 330.
—— occidentalis, *Hall & Whitfield*, Jur., 311.
Lithodomus latus & minimus, *Locard*, Tert., 314.
Lucina oculus, *Blake & Hudleston*, Cor., 301.
Mactra arenaria, Emmonsi, & Utahensis, *Meek*, Cret., 315.
Mænia Koninckii, *Clarke*, see *Koninck*, Carb., 313.
Modiola Matheroni, *Fontannes*, Tert., 107.
Modiomorpha lata & ovata, *Meek*, Trias, 315.
Monopleura Falgasi, figolina, munita, & Montsecana, *Vidal*, Cret., 101.
Myacites inconspicuus & Weberensis, *Meek*, Jur., 315.
Myalina trigonalis, *Etheridge*, Carb., 329.
Myophoria spiralis, *Gabb*, Lias, 309.
Mytilus Bigsbyi & crassiventer, *Koninck*, Carb., 313.
Neilo messanensis, *Seguenza*, Mioc., 319.
Neithea complexicosta, *Gabb*, Cret., 309.
Nucinella Calabra, *Seguenza*, Mioc., 319.
Nucula Peruana, *Gabb*, Lias, 309.
—— tumida, *Woods*, Tert., 324.
—— Youngi, *Etheridge*, Carb., 329.
Nuculites triangulus, *Hall & Whitfield*, Dev., 311.
Ostrea Bryanii, exogyrella, & Littlei, *Gabb*, Cret., 309.
—— Luynesi, *Lartet*, Cret., 142.
—— pseudo-crassissima, *Fuchs*, Tert., 309.
—— (vesicularis), var. judaica, *Lartet*, Cret., 142.
Pachydomus Danai, *Koninck*, Carb., 313.
Palæarca interrupta & subarcuata, *Koninck*, Carb., 313.
Palæorbis hamatus, *Goldenberg*, Carb., 311.
Panopæa punctatoplicata, *Boehm*, Neoc., 55.
—— undulata, *Gabb*, Cret., 309.
Paracyclas peroccidens, *Hall & Whitfield*, Dev., 311.
Pecten Agathis, *Gemmellaro*, Lias, 330.
—— argentarius, *Gabb*, 309.
—— Bonifaciensis, *Locard*, Tert., 314.
—— Cavarum, comitatus, & Davidi, *Fontannes*, Tert., 107.
—— isthmicus, *Fuchs*, Tert., 309.
—— Kochii, *Locard*, Tert., 314.
—— Lessepsii, *Fuchs*, Tert., 309.
—— Ponzii, *Gemmellaro*, Lias, 330.
—— Raimondii, *Gabb*, 309.
—— Stoliczkai, *Gemmellaro*, Lias, 330.
—— Vasselii, *Fuchs*, Tert., 309.
Peronæoderma Georgiana, *Gabb*, Cret., 309.
Pholadomya australis, *Gabb*, Cret., 309.
—— Hantkeni, *Boeck*, Eoc., 55.
—— Littlei, *Gabb*, Cret., 309.
—— Luynesi, *Lartet*, Cret., 142.
—— Raimondii, *Gabb*, ? Jur., 309.
Pholadomya Vignesi, *Lartet*, Cret., 142.
Pholas Brocchi, Desmoulinsi, & Vara, *Benoist*, Mioc., 300.
Pinna Kingi, *Meek*, Jur., 315.
Placunomia lima, *Gabb*, Cret., 309.
Placunopsis Zitteli, *Gemmellaro*, Lias., 330.
Pleurophorus biplex & Morrisii, *Koninck*, Carb., 313.
Plicatula torta, *Gabb*, Cret., 309.
Posidonomya fragosa, *Meek*, Carb., 315.
Protocardium isocardioides, *Blake & Hudleston*, Cor., 301.
Pteria inconspicua, *Gabb*, Lias, 309.
Radiolites angulosus, var. Ibericus, Fumanyæ, laciniatus, Moroi, & Osensis, *Vidal*, Cret., 101.
Requienia Moroi, *Vidal*, Cret., 101.
Sanguinolites? Abdenensis, *Etheridge*, Carb., 307.
—— Etheridgei, MacCoyi, Mitchellii, & Tenisoni, *Koninck*, Carb., 313.
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Schizodesma? appressa, *Gabb*, Cret., 309.
Scrobicularia Dulwichensis, *Wood*, Eoc., 524.
Septaria Henrici, vel primigenia, *Benoist*, Mioc., 300.
Septocardia carditoidea and typica, *Hall & Whitfield*, Jur., 311.
Solecurtus tenuistriatus, *Benoist*, Mioc., 300.
Sphæra Whitneyi, *Meek*, Trias, 315.
Sphærulites Aagerensis, *Vidal*, Cret., 101.
—— bohemicus, *Teller*, Cret., 321.
—— minor, planicostatus, posæ, & pulchellus, *Vidal*, Cret., 101.

Tancredia disputata, *Blake & Hudleston*, Cor., 301.
Tellina Cainozoica, *Woods*, Tert., 324.
—— Georgiana, *Gabb*, Cret., 309.
—— isonema & modesta, *Meek*, Cret., 315.
—— peruana, *Gabb*, Lias, 309.
Tellinomya Darwini, *Koninck*, Carb., 313.
Teredinopsis problematica, *Fuchs*, Tert., 309.
Teredo Artiguei & Duleaui, *Benoist*, Mioc., 300.
Trigonarca cuneata, *Gabb*, Cret., 309.
—— Orbignyana, *Gabb*, Sec., 309.
—— peruana, *Gabb*, Cret., 309.
Trigonia angulicosta, *Gabb*, Cret., 309.
—— bella, crenulifera, Culleni, debilis, Dunscombensis, exaltata, Hudlestoni, Keepingi, *Lycett*, 315.
—— quadrangularis, *Hall & Whitfield*, Jur., 311.
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—— persinuata, *Meek*, Carb., 315.
Camarophoria crenulata, *Gosselet*, Dev., 69.
Chonetes Loganensis, *Hall & Whitfield*, Carb., 311.
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—— orbiculoides, *Krause*, Sil., 314.
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Kutorgina minutissima, *Hall & Whitfield*, Camb., 311.
Leptæna gibbosula, *Gemmellaro*, Lias, 330.
—— melita, *Hall & Whitfield*, Camb., 311.
Lingulella nicholsoni, *Callaway*, Camb., 302.
Lingulepis ella, *Hall & Whitfield*, Sil., 311.
—— mæra & minuta, *Hall & Whitfield*, Camb., 311.
Obolella discoida, *Hall & Whitfield*, Camb., 311.
—— sabrinæ, *Callaway*, Camb., 302.
Orthis Pogonipensis, *Hall & Whitfield*, Sil., 311.
Porambonites obscurus, *Hall & Whitfield*, Sil., 311.
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—— subhorridus, *Meek*, Carb., 315.
Rhynchonella Antonii, *Gabb*, 309.
—— boloniensis, *Gosselet*, Dev., 69.
—— Briseis, *Gemmellaro*, Lias, 330.
—— Dumontii, *Gosselet*, Dev., 69.
—— Emmonsi, *Hall & Whitfield*, Dev., 311.
—— Glycinna, *Gemmellaro*, Lias, 330.
—— inversa, *Koninck*, Carb., 313.
—— Omaliusi, *Gosselet*, Dev., 69.
—— Orsinii, pusilla, & Reynesi, *Gemmellaro*, Lias, 330.
—— Stephani, *Davidson*, Jur., 305.
—— triæqualis, *Gosselet*, Dev., 69.
—— Worobiewensis, *Nikitin*, Jur., 366.
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—— argentarius, *Meek*, Dev., 315.
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—— tegulatus, *Trautschold*, Carb., 334.
Spirifera alia, *Hall & Whitfield*, Trias, 311.
Spiriferina sicula & Statira, *Gemmellaro*, Lias, 330.
Spirigera reticulata, *Gosselet*, Dev., 69.
Strophomena nimia, *Hall & Whitfield*, Sil., 311.
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—— rudis, *Gemmellaro*, Lias, 330.
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Ceriopora cincta† & inæquabilis, *Trautschold*, Carb., 334.
Dendricopora Hardyi, *Koninck*, Carb., 313.
Discotubigera actinoides & insignis, *Manzoni*, Mioc., 315.
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Fenestella arctica, var. Scotica, *Etheridge*, Carb., 307.
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Filisparsa astalis, elegantissima, & typica, *Manzoni*, Mioc., 315.
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Idmonea vibicata, *Manzoni*, Mioc., 315.
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—— proboscidea & rugulosa, *Manzoni*, Mioc., 315.
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